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ABSTRACT

Focusing on what quality "is" in technical and scientific communication programs, the papers in this proceedings are divided into five sections: Quality in Programs; Quality in Administrators; Quality in Teachers; Quality in Students; and Quality in Graduates. Papers in the proceedings are: "The Proof Is in the Pudding: Evaluating Quality in Technical Communication Certificate Programs" (Sherry Burgus Little); "Developing a Technical Communications Option at Oregon Institute of Technology" (Avon Murphy and David Dyrud); "Quality in a Bachelor's Degree Program" (Jim Corey and Michael Gilbertson); "Quality in a Bachelor's Degree Program" (Gloria Jaffe); "A High Quality Graduate-Level Degree Program in Technical and Scientific Communication: A Series of Challenges" (Laurie S. Hayes); "The Graduate Program in Technical Communications" (Simon S. Johnson); "What is Quality in an Administrator of a Program in Technical and Scientific Communication?" (Mark P. Haselkorn); "What Is Quality in a Technical/Scientific Communication Program Administrator?" (Marilyn Schauer Samuels); "What Constitutes Quality in the Administrator of a Program in Technical and Scientific Communication?" (Muriel Zimmerman); "On What Is Quality in a Teacher in a Program?" (Mary B. Coney); "The Technical Writing Teacher Should Do Technical Writing" (John S. Harris); "Teaching Technical Communication: How Much Teaching? How Much Technology?" (Sam C. Geonetta); "Quality in a Technical Communications Student: 'T' Is for Technology" (Mary M. Lay); "Helping Our Students Acquire a Sense of Quality" (Daniel R. Jones); "What Is Quality in a Technical Communications Graduate?" (Karyl Severson); and "How Do We Measure the Quality of Our Graduates?" (Judith Kaufman and John Eldridge). The proceedings also includes a message from the president of CPTSC, the conference program, and results of the annual business meeting. Appendixes present the constitution, lists of meeting sites and dates, a map locating institutions represented by members, a list of members, and a list of ERIC document numbers for past proceedings of the CPTSC. (RS)

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Proceedings

1986

CPTSC

The Council for Programs in Technical and Scientific Communication

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PROCEEDINGS 1986

The Council for Programs in Technical and Scientific Communication

Sam C. Geonetta
editor

13th
ANNUAL
MEETING
Portland, Oregon

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PREFACE

The conclusion to then-President Patrick Kelley's statement in the Proceedings 1984 is worth repeating here:

> Beyond the five purposes of the Council is another purpose, a purpose that is increasingly apparent now that programs in technical and scientific communication exist in quantity. This purpose is the promotion of quality in our programs.
>
> . . .as the current president of the Council, I urge members to build quality programs. Quality will be the watchword of the Council at present--and probably into the future.

In that spirit, members of the Council met at Portland for a free exchange of ideas about what quality "is," in technical and scientific communication Programs. The presentations of participants represented a range of philosophies, but all represented the commitment to quality articulated by Patrick.

Quality as the focus of the 1986 meeting was more than appropriate for a maturing field of study, especially given the rapid growth of programs and student enrollments. As I edited these Proceedings I realized that the work of many of the participants in the meeting has flowered in just the six years I have been with the CPTSC. Their programs have been the focus of other presentations at past CPTSC meetings as their founders/administrators/faculty have worked for "quality control" through the feedback from concerned colleagues.

A word about the content of this publication: in the call for papers for the 1986 meeting, Patrick Kelley asked presenters to submit brief statements to serve as catalysts for discussions. When I asked for final copy I asked for expanded versions of these statements. In some cases participants chose to submit only their statement, in other cases they chose to expand their remarks. Thus there is a range of detail in these Proceedings. Nonetheless, the papers offered here represent various essential perspectives on what quality "is": perspectives that help give focus to our efforts to build a field that is well-respected for its programs, administrators, teachers, students, and graduates.

Sam C. Geonetta, Editor
University of Missouri-Rolla
Rolla, Missouri

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FROM THE PRESIDENT

In 1994 CPTSC will be holding its 20th annual meeting. Where will we be as an organization in 1994, and what will we have done to get there?

The members of the Executive Committee (1986- 88) share a keen sense of responsibility for maintaining and building on past accomplishments and generating both the general guidelines and the specific project plans for ongoing activities that will eventually lead us to the completion of our second decade.

What shape these plans will actually take, of course, depends on the opinions and the participation of the entire membership. I ask each of you to assist your Executive Committee in orchestrating CPTSC's progress through its second decade. Tell us what you think; volunteer to work on current CPTSC projects that interest you; propose new projects as they come to mind. Please don't wait for annual meetings to share your needs, thoughts, or suggestions with your elected officers.

The following is a list of projects that CPTSC is currently pursuing or would like to pursue. Some will be completed within the next four years; others are ongoing. Contact the directors of projects already in progress if you would like to participate. Contact your president or vice-president if you would like to direct or participate in a proposed project or to suggest a project not included in this list:

- Special issue of THE TECHNICAL WRITING TEACHER

In Spring 1989, a special CPTSC issue of The Technical Writing Teacher will be published devoted to the concerns of program administrators. The deadline for submissions is January 1, 1988. Please send manuscripts with a stamped, self-addressed return envelope to:

Marilyn Schauer Samuels
Department of English
Guilford House, 314
Case Western Reserve University
Cleveland, Ohio 44106

- CPTSC NEWSLETTER

To facilitate interaction and idea exchange in the intervals between annual meetings, Gloria Jaffe and Daniel R. Jones of the University of Central Florida have proposed a bi-annual newsletter and have generously offered to serve as co-editors. Please contact them if you would like to participate.

- CPTSC/ATTW Joint Survey: Who's Teaching Technical Writing?

A survey for the purpose of creating an accurate profile of the technical writing profession is being prepared under the joint sponsorship of CPTSC and ATTW (Association of Teachers of Technical Writing). It will provide a data base for future decisions about teacher education, re-training, tenure, promotion, and so on. The survey of two-year institutions has already been prepared and distributed by Nell Ann Pickett and Fay D'Angelo of Hinds Junior College (Raymond, Mississippi). Don Cunningham (Texas Tech), Marilyn Samuels (Case Western Reserve U), and Don Zimmerman (Colorado State U) are currently preparing a survey to be distributed to four-year colleges and universities. Please contact them to offer your time or your advice on methods of coverage and funding sources.

- Program Advisory Board

Under the direction of immediate past president, Patrick M. Kelley, plans are affot to create a board of past presidents of CPTSC who will serve as consultants to new or expanding programs. Contact Patrick to discuss needs and procedures.

- STC/CPTSC Joint Projects

Your Executive Committee is currently in contact with STC First Vice President, Austin Brown to consider future joint projects between our two organizations in addition to maintaining and updating of the jointly published Directory of Programs. Let us know your ideas.

- Other Areas in Need of Development
  - Corporate liasons with CPTSC
  - Liasons with private and public funding agencies
    - A program is needed to educate potential funding sources in what technical communication research is and what purposes it serves for both the humanities and science/technology. If you have ideas, contact Member-at-Large, Carol S. Lipson (Syracuse University).

As this list shows, much of what is happening in CPTSC relates to the theme of our forthcoming 14th annual meeting: Reaching Out. Although there are now over 100 program directors in CPTSC, we are still compact enough to reach out to each other and to create and achieve joint goals. As we move toward our 20th annual meeting in 1994, let us continue CPTSC's honored tradition of sharing our ideas and our talents and of fostering cooperation and quality in our profession.

Marilyn Schauer Samuels

Marilyn Schauer Samuels

President

PROGRAM

13TH Annual Meeting
of
The Council for Programs
in Technical and Scientific Communication

Red Lion Inn/Columbia River
Portland, Oregon
April 17-18, 1986

Thursday, April 17

"What is Quality in a Graduate Program?"

Beekman W. Cottrell, Carnegie-Mellon University
William Elliott, Drexel University
Laurie S. Hayes, University of Minnesota-St. Paul
Simon S. Johnson, Oregon State University

"What is Quality in an Undergraduate Program?"

David Dyrud and Avon Murphy, Oregon Institute of Technology
James Corey and Michael Gilbertson, New Mexico Institute of Technology
Gloria W. Jaffee, University of Central Florida
Sherry B. Little, San Diego State University

"What is Quality in a Service Program?"

Virgina A. Book, University of Nebraska
Carol Lipson, Syracuse University
Andrea C. Walter, Rochester Institute of Technology
Donald E. Zimmerman, Colorado State University

Friday, April 18

"What is Quality in an Administrator of a Program?"

Mark P. Haselkorn, University of Washington
Marilyn S. Samuels, Case Western Reserve University
Muriel Zimmerman, University of California-Santa Barbara

"What is Quality in a Teacher in a Program?"

Mary Coney, University of Washington
John S. Harris, Brigham Young University
Sam C. Geonetta, University of Missouri-Rolla

"What is Quality in a Student Who Graduates?"

Judith Kaufman and John Eldridge, Eastern Washington University
Daniel R. Jones, University of Central Flordia
Mary M. Lay, Clarkson University
Sandra Oster, Portland State University
Karyl Severson, Pacific Telecom, Inc. and STC
Jack Falk, Servio Logic Development Corporation

Annual Business Meeting

Quality in Programs

THE PROOF IS IN THE PUDDING: EVALUATING QUALITY IN TECHNICAL COMMUNICATION CERTIFICATE PROGRAMS

SHERRY BURGUS LITTLE
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SAN DIEGO STATE UNIVERSITY

In technical writing, when we write instructions (or the "recipe") for someone to build a house, we can measure the quality of our instructions by the tangible results of people following our instructions. If the finished product looks like the plans, if the specs are followed and tolerances have been met, we can measure quality of the construction and, on a practical level, the quality of the instructions.

On the same practical level, when evaluating the quality of technical communication educational programs, we can argue that the end results, students being hired and employers being satisfied with their performance on the job, establish the success of a program or its quality. This equation, success = quality, raises the issue of equating success with quality. Is a quality program defined as one that results in students getting jobs? Is the goal, the philosophic base for certificate programs in technical communication, to place people in gainful employment? If we accept this, establishing quality would then be a matter of establishing quantifiable parameters--80 percent placement with 75 percent satisfaction with performance, for example, although we might quibble about the quantities of these parameters.

However, if quality is reduced to quantity, in the same sense of a finished house's tolerances, is an essence of what is meant by quality lost? A house may be serviceable, useful, and well-built, but is there something within the humanistic tradition, the good life (whatever that may be defined as being), the educated, self-examined life in the liberal arts tradition missing in such a definition? Such philosophical concerns pose unanswerable questions--and indeed we can, as a result, enter the cloudy realms of philosophical discussions of "quidditas" as Stephen Dedalus does to forestall making any decisions at all--but all educators, and technical communication educators particularly, live with one foot in the "real" world of the practical and the other in the "real" world of the ideal. With this reservation in mind, I do propose that the proof is in the pudding, that we can define quality of certificate programs in technical communication, indeed quality of education, by end results, but not exactly in the same practical sense as described above.

INSTRUCTIONAL SYSTEM DESIGN

These unanswerable questions may become answerable if criteria for evaluating the quality of programs are part of an instructional system design, applying the current strategy of instructional development that has been developed by such people as Robert F. Mager [1], Robert M.

Gagne [2], and Kenneth M. Beach, Jr.[3]. This instructional system design is called by many names:

- Competency-Based Instruction
- Mastery Learning
- Systems Approach to Education
- Criterion-Referenced Instruction
- Instructional System Development [4, p. 7]

It is based on principles presented by such educational philosophers as Benjamin S. Bloom [5] and James H. Block [6]. Basically it includes four elements:

1. The goals of the program
2. Performance objectives for achieving these goals
3. Task analysis to determine what to do to achieve educational objectives and goals
4. Evaluation

Within such a systematic scheme, the "up-front" analysis establishes the goal, or philosophical base, for the certificate, or any other kind of educational program, and its success in achieving that goal, whatever it is, results in evaluation criteria for assessing the quality of the program. This system leaves the term "quality" as relative to the goal of the program, giving it a philosophical base as well as a measureable level for determining quality.

EVALUATING QUALITY IN CERTIFICATE PROGRAMS

To define quality in technical communication certificate programs, we must first establish that a certificate program is not a degree program. A certificate program has a more limited and practical goal than does a degree program. At either the two-year college or the university level, certificates may be adjuncts to a degree program in various other disciplines or it may be pursued as an end in itself, either by people already possessing degrees or those not interested in pursuing degrees, although having a degree is increasingly a requirement for most employment and has been used in a decision that legally defined technical communication as a profession [7].

When the different certificate programs in technical communication are studied, it is alarming to note the diversity in them. Some may require taking only two or three courses, while others may require as many as 21 hours of courses, slightly more than that required for some undergraduate minors. Storms [8] and Cunningham [9] have both written about this diversity, indeed on the diversity in the types of programs offered throughout the United States. Cunningham, past president of the Association of Teachers of Technical Writing, has noted in a speech to a Society for Technical Commuinication regional workshop on education of technical communicators that he did not "know whether this variety of programs is a good thing or not" [p. 4]. The need for defining quality within this diversity is critical, especially considering the increasing number of new programs that are being developed in the United States. Using an instructional systems design provides the means for accomplishing this definition.

What then is this more limited and practical goal of certificate programs? Simply, it is to supply students with knowledge that will allow them to achieve entry-level positions in the profession of technical communication by mastering the tasks and knowledge identified during the development of an instructional system design. With such a goal in mind and within the context of the philosophy of instructional system design, a certificate program's quality can be evaluated by its success in placing students and the satisfaction of employers with the performance of these students. How many students are placed and how well they perform on the job provide measurable and quantifiable evidence of the quality of the certificate program.

REFERENCES

1. See, for example, Robert F. Mager, *Goal Analysis*, 2nd ed. Belmont, California: Pitman Learning, Inc., 1984; *Preparing Instructional Objectives*, 2nd ed.; and *Measuring Instructional Results*, 2nd ed.

2. An explanation of task analysis is given in Robert M. Gagne, "Military Training and Principles of Learning," *American Psychologist*, 17 (December 1962), reprinted in Ron Zemke and Thomas Kramlinger, *Figuring Things Out, A Trainer's Guide to Needs and Task Analysis*, Reading, Massachusetts: Addison-Wesley Publishing Company, Inc., 1985, pp. 263-275.

3. Robert F. Mager and Kenneth M. Beach, Jr., *Developing Vocational Instruction*, Belmont, California: David S. Lake Publishers, 1967.

4. William E. Blank, *Handbook for Developing Competency-Based Training Programs*, Englewood Cliffs: Prentice-Hall, Inc., 1982.

5. Benjamin S. Bloom, *Human Characteristics and School Learning*, New York: McGraw-Hill Book Company, 1976.

6. James H. Block, ed. *Mastery Learning*, New York: Holt, Rinehart and Winston, Inc., 1970.

7. Frank Smith, "Technical Writers Legally Professionals Now," Technical Communication (First Quarter 1981), p. 4.

8. C. Gilbert Storms, "Programs in Technical Communication," Technical Communication (Fourth Quarter 1984), pp. 13-20.

9. Donald Cunningham, "The Education of Technical Communicators," keynote address, STC Third Annual Workshop, Socorro, New Mexico, November 2, 1985.

DEVELOPING A TECHNICAL COMMUNICATIONS OPTION AT OREGON INSTITUTE OF TECHNOLOGY

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INTRODUCTION

We at Oregon Institute of Technology have developed and continue to refine a technical communication educational plan designed expressly for our kind of institution and student body. OIT offers a new Technical Communications Option that imparts distinctive qualities to our graduates. We want in this paper to describe briefly what we require of students, how our option has grown within a distinctive environment, how the college's administrators have supported us, and what the future may hold for our kind of technical communication plan.

ORIGINS AND DEFINITION

OIT is one of eight institutions in the Oregon State System of Higher Education. As in any other system, we in the Communications Department had to follow mandated procedures when we proposed our plan:

1. We had to show that our option would work within the definitions of the college's mission statement. OIT's mission, in brief, is to impart "knowledge and skills to persons desiring a technical education so that they may lead useful and satisfying lives as contributing citizens to the society in which they live and work." These high-sounding words have

translated into a 97 percent placement record for our graduates--and clearly told us that we had to make our technical communication plan truly "technical."

2. No proposal of our type is accepted by the State System without documentation that the proposers have completed liaison work with industrial leaders. Employability, after all, is determined not by pedagogues but by employers. In the initial stages of developing our Technical Communications Option, we consulted with about 30 industry representatives who already employ OIT graduates in electronics, computer hardware and software systems, laser optics, civil engineering, etc.
3. We had to show, finally, that we were building our option on current departmental strengths. This we did by indicating that our department has for years provided service courses in technical writing and speech, including advanced courses. (At least 10 OIT graduates, in fact, have been hired as technical writers in recent years because of the quality of these courses.) We gained strength this year by hiring two exceptionally well-qualified teachers, one active in STC and the other experienced as a writing consultant for 3M.

Successfully going through these steps led to approval. Our new Technical Communications Option requires 18 quarter hours already required, for example, in such B.S. programs as those in Engineering Technology:

Wr 121	English Composition
Wr 122	English Composition
Wr 227	Technical Report Writing

Wr 327	Advanced Technical Report Writing
Sp 111	Fundamentals of Speech
Sp 321	Discussion Processes

To complete the option, students take four additional courses from the following:

Com 301	Theories and Applications of Communication
Wr 328	Advanced Technical Journalism
Wr 329	Publications Design and Production
Wr 350	Documentation Development
Wr 410	Proposal and Grant Writing
Wr 415	Technical Editing

We believe our students will be well prepared to enter technical writing positions because they will be not only technology ready, having completed a baccalaureate in engineering technology, but also writing ready, having completed 12 hours in Communications beyond the 18 hours of general education requirements.

ENVIRONMENT

An excellent technical communications program cannot arise full-formed from a vacuum. Victoria Winkler Mikelonis and Thomas E. Pearsall have both explained persuasively that any sound program must build upon the existing strengths of a department and an institution. The program developer must carefully examine the environment of the planned effort. We believe our school's identity to be so unlike that of the vast majority of U. S. colleges and universities that our program does not resemble others.

Our technical communication course work is housed within the Communications Department. Ours is not an English department. While students can elect at OIT course work in fiction, poetry, drama, and general humanities, such classes are not offered by Communications faculty. Our instructors may well have literature degrees, but we hire them for their ability to teach communication skills. One element we like to see as we screen applicants is actual experience in technical writing. In fact, in recent years we have not even paid interview expenses for technical communication applicants lacking such experience. This attitude may seem short-sighted to some, even mean-spirited to liberal arts graduates unsullied by the American businessplace. But it helps guarantee a faculty unified in its devotion to OIT's mission, as deserving of students' respect for seasoned professionals as people in other departments and able to contribute on an equal footing with those colleagues. We feel much like our counterparts at the University of Washington, where the Technical and Scientific Communication faculty likewise teach within a non-literature departmental environment. They point out that in our kind of setting teachers "differ more in their exposure to writing in the world of work [as compared to technical writing teachers within traditional English departments] than in their academic backgrounds or abilities. Teachers in technical writing programs in colleges of engineering, for example, are daily studying ways to apply rhetorical principles to professional problems. It is this constant and intimate interaction with working situations that primarily distinguishes the faculty members outside the English department." [Mary B. Coney, Judith A. Ramey, and James W. Souther, "Technical Writing in the English Department: An Outside Perspective," ADE Bulletin, no. 79 (Winter, 1984): 40.] Our peers in other departments, then, feel little reason to view us as outsiders.

We teach people who are progressing through what we call an inverted curriculum. Students in most colleges take during their first two years relatively general courses, moving to more specialized classes toward graduation time; many change or first declare their majors during these final years. OIT has reversed this sequence. Most of our students throw themselves into specialized technological course work during their first two years (many have the option to leave school immediately after those two years and enter industry as technicians). During the third and fourth years they typically take advanced technical courses and pick up more social science and humanities electives. We in the Communications Department recognize that our students not only are qualified early in their studies to communicate highly technical material, but definitely want to do so. Thus, we can expect our sophomore-level technical writing students to transmit in their written and oral work an eagerness to display their expertise. This eagerness carries over into more advanced classes as well. After all, a student able to build an IBM clone in a cardboard box feels ready to tell us what he is doing!

The students clearly set as their top priority early mastery of their technical fields. This focus means that we cannot try to prepare people who can handle EVERY kind of technical writing job that might arise. Many colleges attempt to expose students to a broad range of projects: perhaps a general-interest public relations handout, a brief computer user's set of instructions, a proposal supporting a charitable organization, copy-editing of a campus bulletin, etc. Given our campus mindset, we cannot assume that we have writers first and technicians second. We instead typically prepare graduates who will feel elation, not depression, when they read in technical communication job ads statements like "Experience in COBOL, Ada, UNIX, data bases, human interfaces required."

COOPERATIVE EFFORTS

Much of our program's success--and our pleasure in working at OIT--derives from the interaction of the Communications Department with the departments offering technical degrees. Since OIT hires technical instructors largely on the basis of their industrial experience, we know these colleagues to be experts in their fields. We can cite here only a few examples of how interaction works for us.

Cooperation begins early. In Writing 121 and 122 we grade students' final examination essays holistically. We invite instructors from other departments to join us in these "reads." Students in Writing 227 must design a report requiring them to initiate and maintain communication with a technical instructor. Frequently Communications instructors enter these discussions as the objectives and contents of reports are clarified during the term.

This interaction accelerates during the senior year when students do a senior project. While major departments handle the senior projects differently--and even give them different names--one example may show how the projects typically operate. In the spring term of the junior year each Electronics Engineering Technology student must identify a problem to be solved by electronic means. The student meets one hour weekly with a member of the EET Department to discuss electronic applications and one hour weekly with a member of the Communications Department to discuss the organization, style, and content of the proposal. The proposal is then sent to an EET instructor, who may agree or refuse to continue working with the student. During the senior year the student pursues the necessary research, writes a report, and orally defends the work. The Communications teacher often serves on the student's senior project committee. And frequently the write-up simultaneously satisfies the major report requirement in Writing 327.

ADMINISTRATIVE SUPPORT

Too many technical communication programs have foundered because the school's administration would not or could not provide adequate support. We are lucky here. Our president and others have proclaimed 1986-87 OIT's "40th Year at the Leading Edge." This slogan translates for our department into two kinds of support.

First is material support. Dr. Larry Blake, our president, has promoted nationally his drive to make ours a "fully computerized campus" by 1987. Thus, technical communication faculty have in all offices IBM or IBM-compatible PCs, they have laser jet printers in their hallways, they and their students use a Harris mainframe system, and we are now working on a networking arrangement. We can easily teach such state-of-the-art courses as Technical Editing, Publication Design and Production, and Documentation Development as they must be taught.

Equally helpful is policy support. On the state level our administrators have obtained quick approval for our plan. On the campus level they have promoted the necessity for strong communication skills in all departments. The faculty orientation week in Fall, 1986, featured a full-day writing-across-the-curriculum workshop. This visible activity places the official seal of support on what clearly has become a campus reality in recent years.

So our administrators have given far more than tacit approval to our Technical Communications Option. They understand what we are doing and lend the support without which our sort of program would fail.

THE FUTURE

Because we know that technical communications programs do not arrive full-blown on a campus, we must also accept the fact that any program needs development. As we look into the future, we see several things that we will implement. First, we will work with West Coast industries to develop an internship program. Students are already familiar with such arrangements in numerous OIT departments, including Surveying Engineering Technology, Medical Technology, and Medical Imaging Technology. We know that internships can benefit the students by providing on-site work experience, but we also foresee the benefits to the department in the sharing between faculty and students that arises from such experience.

Second, we hope to add equipment for the study of documentation. We already have portable facilities to videotape users in the initial stages of documentation preparation. When the new technologies building is completed in the fall of 1987, the Communications Department will have a permanent location for taping in a relatively isolated environment.

Third, we deal with graphics in most of the classes already offered within the option. But we hope to bring together the various computer resources on campus into an advanced computer graphics course worthy of our students' capabilities.

Finally, we recognize that economic resources needed to continue developing our program depend not merely on redirection of on-campus resources but also on the largesse of legislative allocation to the Oregon State System of Higher Education. Hence, we as faculty need to continue our lobbying efforts through the Association of Oregon Faculties to impress upon legislators the importance of increasing education's share of revenues when Oregon's agriculture, timber and light industries are in transition. If we consider our Technical Communications Option worth offering, we must be willing to fight for its continued development.

QUALITY IN BACHELOR'S DEGREE PROGRAMS

JIM COREY AND MICHAEL GILBERTSON
CO-DIRECTORS, TECHNICAL COMMUNICATION
NEW MEXICO TECH

1. INTRODUCTION

Many elements make up a superior bachelor's degree program in Technical Communication. We can't overstress the importance of high admission standards (and higher exit standards), good technical facilities, and professors who distinguish themselves in both teaching and research. But we wish to focus on the curriculum of an ideal program.

A superior curriculum features balance, innovation, and industry contact. Balance means two things: 1) courses in the humanities, the sciences, and in Technical Communication should all be well represented; 2) courses within the major should provide both theory and practice. Innovation requires that directors willingly experiment with their programs. Further, they should encourage imagination within the curriculum by allowing instructors to choose whatever texts and teaching methods fulfill the catalog requirements for each course. Finally, industry contact allows faculty consulting and makes possible internship programs and job placement for students. But industry should never control the design and development of the curriculum.

2. BALANCE

Balance is an abstract quality to which most programs claim to adhere. What director would admit to an unbalanced program? But we want to use the term as precisely as that slippery word will allow. We're going to be very clear about the proportion of coursework we recommend in each area and about the integration of theory and practice.

2.1 Course Work Across the Curriculum

The program in Technical Communication should require an almost even split among courses in 1) Technical Communication and free electives; 2) humanities; and 3) math, science, and technical electives.

2.1.1 Technical Communication and Free Electives. No program deliberately slights this area. In the interest of balance, advanced courses must deal with proposals and manuals as well as the more familiar report writing. At least one advanced course specializing in graphics should be offered. In all courses, principles of graphic design must be integrated to texts. Nor should oral communications suffer. A program should offer a course in public speaking and an advanced course in the oral presentation of technical material. At New Mexico Tech free electives and major courses compose 30% of a candidate's coursework.

2.1.2 Humanities. In a B.S. program this area is occasionally slighted. It shouldn't be. A broad background contributes to a communicator's flexibility and mental agility. At Tech we require 36% of a candidate's coursework be in such areas as philosophy, history, and literature.

2.1.3 Math, Science and Technical Electives. If, in B.S. programs, a tendency exists to slight coursework in humanities, in a B.A. program an even stronger tendency exists to slight coursework in math, science, and technical electives. Though rarely expressed this baldly, the rationale is that a good communicator needn't be as concerned with the substance as with the form of his work: the scientists, engineers, or technicians will guarantee the accuracy of the substance.

This view of technical communicators is narrow. It makes them little more than translators of others' work. Yet in many jobs, where they have the knowledge, technical communicators originate the documents they produce. Our experience suggests that even in "translating" activities, a comfortable knowledge of the technical principles of math and science results in smoother interaction with technicians; this increases the efficiency of the final document.

Consequently we require that 34% of a candidate's coursework be in such areas as engineering, computer science, chemistry, and calculus. To guarantee the validity of this work, our candidates must minor in one of these areas. Among other things, that means preparatory courses, where offered, don't satisfy the requirements. For example math courses don't count below the level of calculus. The program is sufficiently rigorous that many students decide to graduate with a double major: Technical Communication and whatever science they choose. Such students are competitively recruited by employers who want technical communicators.

One pragmatic benefit of this technical emphasis is that students with different concentrations in math and science meet in their advanced Technical Communication courses. In every team project students contribute their different areas of technical expertise. These exchanges help prepare students for the environment that they will encounter in many progressive companies: Throughout *In Search of Excellence*, Peters and Waterman give examples of companies that solve problems through loosely structured meetings of employees representing many different departments and many different disciplines of learning. So in balancing coursework, theory and practice coalesce, as we stress they must in the next section.

2.2 Theory and Practice

Ideally Technical Communication combines theory and practice. Theory at the expense of practical application seems antithetical to a discipline that defines its communication as directly useful (Anderson and Cox 3). Because of this pragmatic slant, curricula rarely allow theory to overwhelm practice. More often practical concerns force theory aside.

Few dispute the practical applications of Technical Communication; hence the proper emphasis on internships in the private sector. But fill-in-the-blank courses, which teach forms and formats rather than rhetorical strategies, do an injustice to students who will face unique professional demands that no program can anticipate with complete accuracy. As long as our graduates are filling in the blanks for which we've prepared them, they won't suffer. But what happens when the blanks differ or when they must design an entirely new form? At least one course must teach the principles of discourse theory from Aristotle to Kinneavy, with due emphasis on how cognitive psychologists like Arnheim have contributed to our understanding of graphic design. Then subsequent courses must stress the application of these principles to any discourse: sales brochures, government proposals, field reports, user manuals, or staff briefings.

Even courses in style and usage must not forget the theoretical underpinning that gives them their vitality.

Students understand grammar and usage imperfectly without a rudimentary knowledge of the history of the English language. Courses should show the difference between descriptive and prescriptive grammar. No course in prose style can ignore the contributions of structural linguists and psycholinguists (see Style, the excellent text by Joseph Williams).

To continue a list of theorists and theories would be self-defeating because the more extensive the inclusions, the more problematic would be the exclusions. Arguing over what theoretical concerns take precedence diverts us from the issue: Practice corrects the possible bias of theory. But theory corrects the inflexibility of rote practice that doesn't give students the intellectual tools to deal with a swiftly changing professional environment.

3. INNOVATION

Those changes in the professional environment to which we just alluded place a premium on flexibility in course design and in teaching approaches to the courses.

3.1 Course Design

A curriculum should leave options open, not close them. Directors should welcome any suggestions and regularly discuss proposed changes. No curriculum is graven in stone, so catalog descriptions shouldn't be too restrictive. Combining courses, breaking one course into two, changing the requirements for graduation--the time to tinker is anytime the faculty debates a suggestion and deems it worthwhile. What we suggest is not a specific guide but an attitude. Change for its own sake quickly becomes an attempt to appear trendy, but resistance to change because of inherent inertia is just as damaging.

3.2 Teaching

With teaching innovation specifically in mind, we enjoin designers to resist making catalog descriptions of courses too restrictive. Certainly instructors should be achieving the stated goal of each course. How they do so, though, should be left to the individual instructors. Directors should encourage innovation from their professors. We think that energy spent enforcing certain methods or texts profits less than energy spent hiring good people. If you have good teachers, get out of the way and let them teach, let them experiment.

4. INDUSTRY CONTACT

In the section on balance we observed that Technical Communication should combine the theoretical with the practical. Theory benefits from being tested against the practical demands of industry. These demands should be met through faculty consulting and student internships; they should be resisted when industrial advisory boards attempt to control curricula design.

4.1 Faculty Consulting

Some schools discourage faculty members from accepting consulting positions on the grounds that consulting would interfere with research or teaching. But just as scholarly research should complement teaching, consulting jobs with industry should also benefit teaching by keeping professors current with the industrial demands their students will face. Perhaps colleges could encourage consulting by crediting such work toward tenure or advancements in rank, much as they now credit publications.

4.2 Student Internships

Apprentice programs are widely accepted and need no special pleading. That these programs exist amid academic requirements emphasizes the blend of practical and theoretical that characterizes our discipline. Because of its importance, a solid internship program should be vigorously pursued by Technical Communication departments. Directors should actively recruit industries for their internships. Faculty members should serve as liaisons between their departments and industry so they can keep the quality of internships high--another reason for encouraging faculty consulting.

Good internships are started by energetically recruiting industry contacts, but they are maintained by reputation. If your teaching program is solid and if your students reflect your program's quality, word of mouth in the private sector will keep your internships rolling. Industry wants good people; they'll soon learn if your program can supply them. And industry often views a summer internship as an extended interview--a time for evaluating a potential employee.

4.3 Industrial Advisory Boards

Advisors from the private sector can help programs in Technical Communication. Among other benefits, these advisors can be invaluable contacts for your internship program. Their advice should be sought for course and program design and on course content. But under no circumstances should academicians abdicate their responsibility to control their programs, to balance practice and theory, to maintain both the vocational and the scholarly.

Of necessity, most industries live in the present; curriculum designers must live in the future. At best, except for some far-sighted companies, future concerns of industry are for the immediate future. The woes of our auto manufacturers in the 70's and the current problems in mining and petroleum attest to the dangers of myopia. The business of academia (whose track record has its own failures) should be more than the immediate future. "Revolutionary changes in American industry clearly suggest that any education that prepares students only for the immediate future may well be teaching skills that will become obsolete in five years" (Tebeaux 426).

We must maintain a proper stress on the scholarly, the theoretical. If students understand principles, they can apply them to new situations. Essentially we're arguing for the same balance we argued for earlier between theory and practice. If industrial advisory boards tilt so strongly toward the immediately practical that the balance is lost, faculty members must restore the balance. Industry's voice should be welcome, but we can't surrender our autonomy and our responsibility.

5. SUMMARY

We certainly haven't written the final words on superior quality in curriculum design and development. If some of our recommendations draw fire, that should be all for the better. Any academic discipline profits from healthy, even controversial, self-examination.

Our examination presumes that a technical communication program will benefit if it

* evenly mixes courses in humanities, sciences, and the major;
* balances theory and practice;
* encourages innovation in course design and individual teaching methods;
* promotes industry contact through faculty consulting and student internships, while its developers retain autonomy in course design and development.

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Quality in an Undergraduate Program in Technical and Scientific Communication

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Programs in Technical and Scientific Communication must be flexible, having a broad base in traditional literature and rhetoric. At the same time, these programs must present opportunities for many pragmatic encounters with specific tasks and skills necessary in the role of a professional technical writer. Programs that integrate these two areas smoothly and coherently afford a quality education for the student working toward a degree in Technical and Scientific Communication.

Our Technical Writing and Editing program at the University of Central Florida integrates theory with practical skills, offering students a base in literature, creative writing, and linguistics, and creates opportunities for students to meet with individuals practicing the profession of Technical and Scientific Communication.

Assignments in courses such as our Technical Documentation series of workshops, Survey of Literature of Science and Technology, Technical Vocabulary, and Science and the Lay Reader provide students with theorectical bases as well as practical skills.

A typical project in our Technical Documentation II course demands that the class write a collaborative document for an outside source. For example, one class wrote an installation manual for the Florida Solar Energy Center on Solar Energy Heat Pumps. A source person from the Center acted as consultant for the project. The students were required to research the material for the manual, and write, edit, and format the manual. At the end of the semester, they delivered a camera-ready copy to the Center. It is now in use as a training manual.

This project enabled the students to call upon the research and writing skills they had learned in their previous courses in the program. They also were at ease with a technical subject because of the reading and discussion required of them in their literature courses.

Integration through pragmatic encounters other than in the classroom is vital to a quality program in Technical Communication. Our program provides these encounters through our working Board of Advisors who are involved in all phases of our program, through our technical writing laboratory equipped with the latest hardware and software related to all technical writing, and through student participation in our local STC Chapter.

Members of our Board of Advisors lecture to classes about their particular expertise, serve as source personnel for research in various classes, teach as adjuncts for some of our graphics and production courses, and are available for consultation.

Our laboratory has become a learning center for our students. When the students are working in the lab, they find themselves consulting with one another, helping to solve mutual problems. The lab also serves as a practical classroom.

Students in our Documentation series help to put out our local STC news letter, gaining needed experience in another aspect of technical writing.

UCF's and STC's co-sponsored annual Florida Technical Communication Conference provides another encounter for educators, professionals, and students to exchange ideas. The students help to set up the conference and participate in all phases of it. Each year, students prepare the brochure, create displays, act as hosts, and attend the sessions. In addition, each year we have had a presentation by one of our students.

A Technical and Scientific Communication program that deals effectively with all these phases of education can provide quality education for its students. The Technical

Writing and Editing program at the University of Central Florida has proven that this philosophy can work successfully.

A HIGH QUALITY GRADUATE-LEVEL DEGREE PROGRAM IN TECHNICAL AND SCIENTIFIC COMMUNICATION: A SERIES OF CHALLENGES

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A high quality graduate-level degree program in technical and scientific communication is one that challenges its students, its faculty, and the professional technical and scientific communication community.

In a high quality graduate-level degree program students are challenged to learn more than how to produce different communication products (grant proposals, procedure manuals, newsletters, magazine reports, computer documentation, etc.). A high quality program requires that students learn to become rhetorically sensitive about the communication process: they should become both perceptive and assertive in analyzing audiences, assessing communication purposes, selecting media, and designing and evaluating messages. Furthermore, a high quality program requires that the students learn to become rhetorically sensitive about technical and scientific subject matters. There are many excellent communication programs that lead students to consider critical issues in communication theory in general. A quality graduate program in technical and scientific communication, however, must require that students be interested in technology and science and that they be able to discuss and manage the practical and ethical problems of communicating that particular category of subject matter.

In a high quality graduate-level degree program faculty are challenged to go beyond a "how to" course syllabus and to resist the temptation to use the same course syllabus more than once. Faculty are challenged to keep current in their reading and conducting technical and scientific communication research and in their observing technical and scientific communication in the world of work.

In a high quality graduate-lvel degree program members of the professional technical and scientific communication community are also challenged. They are challenged to respect the students of the program (acting as their mentors and internship supervisors). They are challenged to be involved with the faculty of the program (advising their curriculum development and offering them opportunities for research and observation). They are challenged to welcome the graduates of the program (working cooperatively with them and including them in established professional networks). They are challenged to respond to the knowledge and insights of the program (being open to the process, and possible pressures, of change).

In my mind these challenges are not negotiable; it is imperative that we set high standards for the quality of graduate-level programs in technical and scientific communication. But neither are these challenges impossible to meet; it is heartening that the Council for Programs in Technical and Scientific Communication continues to facilitate our caring about quality and our sharing of the various means to that end.

THE GRADUATE PROGRAM IN TECHNICAL COMMUNICATIONS

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The primary goal of a graduate program in technical communications should be the training of individuals who can deal with a variety of communications situations with confidence. When confronted with a new situation, the individuals should be able either to deal with it or be able to find the best method to deal with it. Such an individual I have labeled "The Communications Expert." I submit that it is the goal of graduate programs to produce such experts.

The question raised is: How do teachers and administrators of graduate programs produce such individuals?

I propose that a program in technical and scientific communication at any level must take into consideration four basic components. At the graduate level, these basics become even more important. The components are language, scientific method, presentation, and application.

Language

Before anything else, the student must have a firm foundation in language. The foundation must include both an understanding of the history and development of English, and an understanding of how the language is actually used. I would include in this area an understanding of classical rhetoric, with its concern for invention, arrangement and style, and especially its concern for audience, a concern that has only recently found its way back into conventional coursework in writing.

Such a broad and deep foundation is necessary to give the professional confidence to use all the tools that language provides, rather than be limited by a set of arbitary rules or practices within any field, which of necessity would be narrow. Such a grounding would, I hope, build in the student a sensitivity to language that would help ultimately break down the barriers that are still too evident between science, technology, and the general society.

One example of the lack of this understanding will illustrate one of the problems: Most of us were told in a writing class somewhere to vary our sentence structure. Some text books still include that bit of advice. Yet twenty years ago, Francis Christensen demonstrated in a study of some of the best stylists in English that professional writers generally do not follow the textbook advice (1). In fact, he speculated that the greater degree to which a student followed the advice, the worse stylistically the writing would be. Our graduates should be not only aware of such findings, but able to make use of them.

Scientific Method

The communications expert must have a thorough understanding of the methods of science. This seems so obvious I hesitate to elaborate on it. Yet in a study released by the National Institutes of Health of the reasons for rejection of proposals received by the member institutions, some 36 percent of the rejections were based in part on faulty methods (2). If the communications experts are going to help these people, who were, one supposes, trained in science, the student must have a better understanding of the scientific method than apparently is imparted by science programs. The student must, therefore, understand the nature of proofs, the nature of logic, and how one builds on evidence to present a case for an argument. The student today must understand statistics and statistical methods. Such knowledge will allow the professional to sort through, with some formal ability to make judgements about validity, the vast amounts of information currently engulfing us.

As a special part of this understanding, the student must be aware of the research in the broad areas of language study and in the cognitive sciences. These sciences are making strides in discovering how individuals acquire, process, and retain information, discoveries that are vital to anyone involved professionally in the transmission of information. Such knowledge should enable the professional to keep up with the latest work in the field, should enable the professional to design communications that are most likely to "work," and perhaps, for those so interested, to contribute usefully to such research.

Presentation

Only after students are grounded in the first two areas does the third become important: formal presentation. This area is generally covered well by traditional programs in technical writing or technical journalism, and I don't mean to minimize its importance. But unless a thorough grounding is made in the first two areas, the professional can be little more than a technician, an individual who manipulates the techniques of the field in accepted and acceptable ways, but without real understanding of why they are successful, and more important, why they are not.

Students should of course be familiar with all the ways of presenting information, including the forms and formats used in the various technical fields. I include here the technical knowledge of each of the media available for dissemination of information. This familiarity is valuable not so much to allow the graduate to step immediately into a position and begin working as to provide an understanding of the strengths and weaknesses of each method of presentation. That understanding, combined with the grounding in cognitive science, would allow the professional to evaluate current practices in a new job and to free him or her from stale or inefficient practices, to allow the professional to design communication "packages" that truly meet the needs of the communication "situation."

Application

Finally, and least important, it seems to me, the student at the graduate level should be reasonably familiar with the vocabulary and methods of a specific field or fields of interest. Such familiarity should allow graduates to converse with confidence with specialists in the course of gathering the information needed to write, edit, or construct communication packages. This fourth area is important partly because employers and specialists expect it. It is least important because no amount of cramming will make the graduate as proficient as the specialist. It is also least important because the graduate is a specialist too, not in the technical area--that's the engineer's or technician's job--but in the area of communication. That specialization is the only reason he or she is employed.

At Oregon State, we have tried to develop a program that covers these areas. We have done it by devising an interdisciplinary program based in three departments: English, Speech, and Journalism. The English department provides coursework in language--history and usage; Speech and Journalism provide coursework in presentation--for Journalism, editing, layout, print media in general; Speech, oral presentation, both direct and electronic. The training in application is provided in part through an internship, and in part through coursework in a field of the student's choice that helps prepare for the internship. The weakest area in the program is the training in scientific method and cognitive science. We try to provide for the latter through courses in the Department of Psychology, where such work is largely located at present, and for the former through coursework in a technical field, in rhetoric, and in other departments in the College of Liberal Arts. I hope as the program matures to develop courses specifically designed to provide strength in areas shown to be lacking. By applying the techniques taught by the program to the program itself, we should be able to provide a course of study that regularly examines itself to turn out an ever-improving "product"--the communications expert.

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Quality in Administrators

What is Quality in an Administrator of a Program in Technical and Scientific Communication?

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A tremendous amount of qualification must introduce any attempt to answer the above question. Even if we isolate those qualities of an effective administrator of a PTSC from the general qualities of effective administrators, we have not gone far enough. The effective qualities of the leader of a PTSC in a college of engineering differ from those of a leader of a PTSC in an English department. (As one of the few people fortunate enough to have been both, I know.) Similarly, there are differences depending on whether or not the program is service-oriented or has its own degree, is only at the undergraduate level or includes a graduate program, is production-oriented or includes a research component, and is staffed by professorial faculty or primarily by instructors.

In our panel discussion, I am sure we will touch on all these possible aspects of a PTSC, but for my one page answer, let me focus on my current position. STC, as we are called, is a program in a college of engineering with a number of undergraduate degree options (some outside the college); a brand new graduate degree option; faculty primarily at the professorial level, but with an equal or greater number of graduate assistants and instructors; a once large, now small, and soon to enlarge again service component--all the while striving to reach an appropriate balance between research and production emphasis.

Now the hard part: what is quality in the administrator of such a program?

Perhaps, it's the ability to make a coherent whole out of a multitude of varied, disparate, interdisciplinary pressures and goals. Document design and user interfaces, publications management and research into the composing process, technical style and natural language processing, internships and information systems, on-line documentation and cross-cultural communication, computer-assisted training and technical writing, electronic publishing and expert systems -- these are just a few of the seemingly unconnected thrusts that, after a while, begin to reach out and touch each other beneath the general heading of technical communication.

The director of a diverse program like that described above, a program in a field that is by its very nature interdisciplinary, must be prepared to walk a precarious tightrope. On one side is the need to include the wide range of faculty and student interests and activities: supporting projects even when the director knows too little about them and leading the group into the new ground which any program intimately connected with science and technology must constantly face. On the other side is the need for a stable environment: assuring that faculty and students understand the driving forces behind the program and their roles within that program, as well as maintaining the traditional anchors of the field.

In short, quality means leading your PTSC into the new, ground-breaking, ever changing, interdisciplinary regions of technical communication while maintaining a coherent, focused, sane program.

WHAT IS QUALITY IN A TECHNICAL/SCIENTIFIC COMMUNICATION PROGRAM ADMINISTRATOR?

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Technical Writing Program Directors function as diplomats. Their territory is almost always "foreign": whoever they interact with, they are almost always translating the language of one culture into the language of another. They must tirelessly re-establish their credentials, bringing knowledge of their own field to others, while at the same time displaying a willingness to learn-- to adapt what they have to offer to a variety of needs and perspectives.

In some ways, Technical Communication Program Directors must be double agents. When proposing courses and programs to humanities divisions, they speak as the emissaries of technology, pleading the cause of one kind of language use-- technical/scientific writing-- to the custodians of the sacred flame of another kind of language use-- "creative" literature.

When interacting with Schools of Engineering, Management, Medicine, etc., they become the representatives of rhetoric, linguistics, humanism, and ethics, demonstrating to one country (Technology/Science) that the formulae for effective expression of its own language are discoverable in the language of another country-- the Humanities.

Program Directors face a different kind of cultural dichotomy when functioning as academic envoys to business and industry. In corporate territory, they must project the double image of coming to learn and to teach. They must translate for industry what they have to offer it and what it has to offer them.

Ultimately, Technical Communication Program Directors are responsible to two additional sets of other-worldlings-- their faculty and their students. For these people whose backgrounds are myriad, program directors must provide a context-- a framework for goals and strategies that results in quality teaching, quality learning, and quality professionalism.

The quality of program directors depends on their audience adapatabiltiy. They must cross back and forth over many borderlines, transmitting the same message in different codes. Their strongest quality is their ability to bridge differences and enable others to bridge them. Their goal is to create and direct programs which unite the disciplines, the faculty and the students, the world of academia and the world of commerce. The special people who achieve this goal are truly amabassadors extraordinaire!

WHAT CONSTITUTES QUALITY IN THE ADMINISTRATOR OF A PROGRAM IN TECHNICAL AND SCIENTIFIC COMMUNICATION?

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PROLOGUE

Our panel at the Portland meeting of the Council for Programs in Technical and Scientific Communication (CPTSC) was not in disagreement about what constitutes quality in a program administrator. Haselkorn's image was of the "precarious tightrope" that administrators walk, leading programs into uncharted, interdisciplinary territory while maintaining balance--their program's and their own. Samuels' analogy was to the foreign service: she described directors of technical writing programs as ambassadors in foreign territories, often double agents. Zimmerman (me), with somewhat less flair, argued that the mark of quality in an administrator is curricular quality: a good administrator runs a program that is responsive to changing conceptions of the subject matter. My implicit analogy was of administrator as visionary.

The only sour notes sounded at our presentation were sounded by our discussion leader who felt that we, in our flights of fancy, had not discussed the issues we were supposed to discuss: budgets, personnel, schedules, priorities, and other genuinely administrative issues. We tried for a minute or two, but we were soon back to our fancies, unwilling, though I think not unable, to focus on the issue of administrators as managers.

I write the following remarks six months after the Portland meeting. My position has not changed; why should it? But this time I will attend, briefly, to some of the managerial issues that affect, and are affected by, the administrator of a program in technical and scientific communication. I will attend to those issues before I attend to making a case for what we have already agreed on: that quality in an administrator is signalled by the curricular excellence of programs. We are not solo flyers, one-man or one-woman shows.

ADMINISTRATORS AS ENTREPRENEURS

As our discussion leader knew well, writing program administrators do not, except at stimulating sessions of meetings such as CPTSC, spend very much of their time having curricular visions. They spend most of their time protecting their enterprise, getting it financed, getting it staffed, and getting it some measure of respect. Their programs are often housed in hostile territory, in English Departments which have mixed feelings at best about the TSC offerings. Their staff--and they themselves--may be ineligible for tenured positions in the departments which house them and their programs. Their budget and space needs may be low priority.

It is not easy to be an employer, and many of us employ a dozen or more teaching faculty. Instructors who teach in our programs sometimes have uneasy relations with themselves and their own career aspirations. Working for us may not be not what they wanted to do with their lives. Sometimes we find that we have hired a writing instructor who is fighting a guerrilla war against the military-industrial complex by way of subverting the teaching of technical writing to engineering students.

Our colleagues, our staff, our campuses may wonder if we have a subject in our programs. Our field is, in Mary Coney's phrase, "academically amorphous. . . with few of the status points or research programs that define and guide a traditional scholarly discipline." Our cross-disciplinary emphases may enrich our understanding of our subject but make it difficult for us and our staff to get research funding.

Our programs are sometimes pushed hard in seemingly opposite directions: pushed to provide skills that make science and engineering graduates more marketable; pushed to provide classes that appear to match provincial needs of industry; pushed to serve the traditional mission of a university, doing research, educating students to outgrow us. Our self-esteem is sometimes shaky: are we somewhat debased, in contrast to our colleagues who teach Classics, or Anthropology, or Germanic Languages and Literature, serving Mammon rather than God?

ADMINISTRATORS AS VISIONARIES

Is it any wonder, then, that program administrators at the Portland meeting, away from telephones, meetings, and budget calls, would rather practice visions than management? We wanted to talk about ways to make our programs responsive to changing conceptions of the nature of technical communication and changing styles of teaching and learning technical communication. We wanted to talk about ways to encourage professional development in our staff, both in the direction of research, because we serve the traditional mission of a university, and in the direction of consulting, because we also want to respond to the needs of industry.

Mostly, we wanted to size up for ourselves some of the dimensions of this multidisciplinary turf that we occupy. The list of disciplines that now impinge on ours grows longer and longer: computer science, cognitive psychology, rhetorical theory, document design, media technology, cross-cultural communication, electronic publishing, artificial intelligence, information systems, linguistics, composition theory, communication theory, database design, for a start.

EPILOGUE

At the October, 1986, conference of the Institute of Electrical and Electronics Engineers Professional Communication Society, Mark Haselkorn, the first of our panelists, was awarded the prize for best paper. His work "Smart Documentation Systems " was judged to be a significant contribution to the understanding of the impact of high technology on the field of professional communication, and a model for further research and analysis.

What Haselkorn assesses is the role of technical communicators in the development of documentation systems that incorporate advances in artificial intelligence and natural language processing. "Will tomorrow's technical writers," he asks, "like today's typing teachers, find the nature of their jobs radically altered by technological developments?" Will tomorrow's technical writers be obsolete?

His answer--and I present it to readers of these Proceedings because he told me that he did not plan to--is that technical writers can be the designers and maintainers of the complex documentation systems of the future, "so long as we do not stubbornly resist change and continue to recognize the value of what we do."

It is more important for an administrator to be visionary--even psychic--than to be entrepreneurial in focus. We need, of course, to be both. At home, on our often-troubled turf, we are entrepreneurs who need time for visions. At conferences such as CPTSC, we indulge ourselves and come home enriched by such indulgences.

Quality in Teachers

ON WHAT IS QUALITY IN A TEACHER IN A PROGRAM?

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One way to approach answering such a question is to remember the many promising, intelligent, hard working teachers each of us has known who entered this field of technical communication but stayed only a brief time, usually leaving to return to their home discipline, usually English composition or literature. While there are as many different reasons for their leaving as people remembered, there are, it seems to me, certain commonalities, which, if phrased in the positive, can become the distinguishing characteristics of those who came and stayed and succeeded.

The first of these is an ability to work, even thrive, in an academically amorphous field, with few of the status points or research programs that define and guide the traditional scholarly disciplines. For many, this lack of order proves intolerable, and they beat a quick retreat to their familiar, however crowded, field of study. For others, technical communication represents freedom from the old and opportunity to break new ground or make new connections among the established fields. The work is neither easy nor superficial, but it _is_ different: it is more varied, more filled with uncertainty as to what to consider germane to a particular issue. Yet we must be able to convey enough sense of control over our materials to have credibility in the classroom and in our scholarship. That's a modest goal and not to everyone's taste. To become an authority, in the way one can be in Chaucer, say, is an improbable and, I think, impossible goal for the technical writing teacher. On the other hand, a quality teacher in our field must have what is arguably a higher goal: (and here I will borrow liberally from that most literary of thinkers, John Keats) that capability of "being in uncertainties, Mysteries, doubts, without any irritable reaching after fact" when none is yet established. He thought, and I agree, that this is truly the mark of a first-rate mind.

The second distinguishing mark of quality is a willingness, even eagerness, to embrace the wider world of experience as the context for our teaching. We can hardly serve our students well by limiting out insights to whatever we can see from our university office window. The field is "out there" and so must we be if we are to represent in any honest way technical communication in the classroom. This means, first of all, respecting those who do technical writing and editing; it means going out and participating in enough ways to get a feel for the real thing; it means bringing that back in an exciting, relevant way to our students. Again, for some teachers, this kind of course development seems beyond the call of duty; they shun the real in favor of the symbol, whereas the quality teacher tries to find ways to unite the two.

Finally, just as the role of authority figure is inappropriate for the effective, successful teacher, so is the idea of role model. We are not what our students are to become. And to judge them by our sights alone is myopic, indeed. For example, while I might personally value the ability to write lucid, lovely prose above all else, I must not assume that those in my class will succeed or fail by that same valuing in the professional world. The number of our students who have succeeded way beyond our expectation suggests that we might best think of ourselves and our role as talent scouts looking for and nurturing a variety of skills and abilities that come under the general description of technical communicator. Our success as teachers can best be measured not by how well we train students in imitation of our abilities but by how well we help them discover their talents. For the quality teacher, this is enough and it is a great deal.

THE TECHNICAL WRITING TEACHER SHOULD DO TECHNICAL WRITING

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Our literature teacher collegues are vulnerable to the criticism that they are essentially parasites on the primary practitioners of literature--the writers of novels, plays and and poetry. But teachers of technical writing who only teach others to do technical writing but do not themselves do technical writing, are similarly ivory tower parasites who teach techniques and principles that they have not proven to be true and that they have not dared test in the field. They suggest the validity of the old axiom attributed to Shaw that those who can--do; those who cannot--teach.

Those teachers who do industrial consulting at least have some contact with the world in which their students will function. They can rationalize that they are professionals, and they are working in industry as their students will do and so, they reason, they can teach relevantly. But if that consulting consists only of presenting thinly-disguised college classroom lectures under the name of technical writing seminars, that industrial consulting is not very complete. It has little relevance to the work of real technical communicators in industry and does not require the same kind of real word validation of knowledge and skills.

If the industrial consulting consists of analyzing communications within an organization and communicating the results of those analyses to management with recommendations for improvement, or if that consulting consists of actually producing proposals, reports and manuals for the organization, then the consulting is more valid in giving the technical writing teacher an understanding of the real world. Such consulting is a better approximation of the work of a real-world communicator.

Most of our students in service courses, however, are not future technical communicators. They are future engineers and scientists, and while such consulting work may simulate the work of the professional technical writer, it still does not give a very clear understanding of the real-world tasks of those engineers and scientists who must choose topics of research, find the information in libraries, laboratories or in the field, evaluate the data, come to conclusions, write their reports or articles, get them published before professional peers, and often get some action taken as result of their writing. These capabilities we expect of the students we teach in service programs, and we should have them ourselves. If we do not we are in danger of teaching false or or incomplete doctrine. Only rarely do technical writing teachers do such writing in scientific and technical fields.

However the technical writing teacher who does indeed do the full range of technical writing tasks learns relevant professional skills that allow him or her to speak with pride and authority in the classroom.

Such a teacher comes to understand the real problems of selection of a topic that must be interesting and relevant to some technical audience. That topic must also be of appropriate size for an article, and it must be saleable or acceptable to an existent journal or magazine or fulfill some valid organizational function. The teacher-writer must also be able to locate the resouce materials--the books, periodicals, brochures, the interviews etc. To do this, he or she must understand the communication network of the field and be able to understand the terminology and the reasoning of the discipline.
Further, the teacher-writer must be able to do the actual writing and produce or arrange for the appropriate graphics and then must understand enough of the politics of the field to place the article. He or she must also be prepared to back the assertions of the article and defend it against the inevitable critical evaluations of the profession--all this usually in a profession other than the one he or she has primarily studied in undergraduate or graduate school.

Of course the teacher-writer can not often enter a high tech field and expect to publish in it, but there are a good many scientific and technical fields where there is room for the advanced amateur. Such subjects range from archeology and astronomy to bee keeping, horticulture, solar heating and ballistics. Articles and books can be written at either the elementary or advanced level on every technical hobby. As long as elaborate laboratory equipment or really advanced knowledge of physics, mathematics or chemistry is not required--and sometimes even if it is--the dedicated amateur can publish. Admitedly in some fields publication by an amateur is extremely difficult, but new comets and new species of butterflies are still being discovered by amateurs, new varieties of roses are being bred by amateurs and innovative aircraft are being designed and built by amateurs. Those things all result in publications.

There are rewards for this, of course. The teacher gains a sense of accomplishment. Further, some judicious mention or demonstration of the products of such work are very impressive to students. My own students, are far more impressed with my articles on firearms technology and aircraft design than they are with my publications in English journals. This sort of thing lends credibility to my classroom and conference advice.

Having actually faced the problems of technical writing and publication gives the teacher insights into those activities that simply cannot come from reading about them alone. Further, the learning of one technology deeply enough to publish in it gives the teacher-writer an understanding of other sciences and technologies. There are similarities of reasoning, of information flow, of audience levels, of evidence, of publication types and of professional politics that are shared by many disciplines. Learning of one give an insight into many. Incidentally, some publications in technical fields, particularly if they are in specialist commercial magazines may earn substantial royalty checks.

Publishing in technical disciplines, however, will not necessarily endear the teacher of technical writing to his or her collegues or to the department committee on salary, promotion and tenure. Such people may be jealous, or they dismiss such publication works as trivial or avocational. You may have some difficulty convincing them that such work is a valid professional activity worthy of the same kind of recognition as an article that analyzes the prosody of a Victorian sonnet.

With or without that recognition of English Department collegues, such work needs to be done. If we are professional practitioners of technical writing, we should be willing to demonstrate our technical writing skills not just by our publications in technical writing theory and pedagogy, but also by our publications in the kinds of fields in which our students are learning to publish.

TEACHING TECHNICAL COMMUNICATION:
HOW MUCH TEACHING? HOW MUCH TECHNOLOGY?

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After submitting my proposal for this presentation I thought "This takes a lot of nerve! After all, I am going to be talking about teaching to a room full of professional teachers. What do I have to offer them that they don't already know?" However, two recent events led me to develop this presentation. On the one hand, I have been working with teaching assistants to help them better communicate technical ideas to their students. My emphasis for them is a "practical" one as I have explored various methods that the teacher can use to be a better classroom communicator. On the other hand, as I talked with different colleagues about improved classroom communication, one of them described teaching as something practical, but also something "mystical". He said that he tries to make the classroom a special place because of this attitude, and is quite successful.

In thinking about what each of these--the practical and the mystical--represented, I realized that my own perceptions of teaching and quality were a mix of them. I realize that this is not a "new" insight; thus, the focus in this paper is not on "newness" but on a perception of what constitutes quality in teaching technical communication. The central premise is that quality resides in an ethos built on presence, a presence derived from a grasp of the art of communication, and, especially for the teacher of technical communication, a curiousity about and a respect for technology.

"Presence" and the Art of Communication

Presence, in terms of one's ability to communicate in the classroom, is summarized well by Kenneth Eble in The Aims of College Teaching: "To be Newton for an hour or Thoreau--even in fun-- is to be wished for rather than sneered at. Why should we not, at the least, step in the classroom and take our better than ordinary selves?"(1)

I believe that what Eble is saying is both practical and mystical and eminently pertinent to quality teaching in technical communication. The quality teacher attends to the practical details of effective communication: his or her ideas are clear, well-organized, and presented in an interesting, lively manner.(2)

As importantly, I also believe that Eble is talking about the mystical in the sense of what the ancient Greeks called "character". The teacher of technical communication exhibits a dynamism that comes from an inner drive: a sense of pride in his or her commitment to professionalism as a communicator and as a teacher of communication. He or she simply brings those qualities of communication to the classroom that he or she would expect from any professional, but especially from a professional whose area of expertise is communication and who expects to teach his or her students to be effective communicators.

Curiosity About and Respect for Science and Technology

The teacher of technical communication also exhibits a curiosity about and a respect for science and technology. Many individuals who teach in this area do not have the technical expertise of someone like

Dr. JoAnn Hackos, with her extensive education in science, or like my colleague Dr. Douglas Wixson, with degrees in engineering and mathematics. Yet, the best of these individuals can still work effectively with technical subjects. Their expertise in communication equips them to deal with complex subjects because they have the mind-set that comes with the practice of effective communication. They know how to collect information, analyze it and report their findings. In essence, they have a curiousity and an analytical ability that helps them recognize the growth of science and technology, its impact on society, and, most importantly, the need for effective communication about it. One way this manifests itself is in a willingness to do "hands-on" work, whether it be going into a coal mine to produce a program on mine safety or sitting on a Masters Thesis committee on "The Petrology and Depositional History of the Hager Formation, Plattin Subgroup, Eastern Missouri.(3)

Quality in Teaching: a Mix of the Practical and the Mystical

In summary, my perception is that quality in a teacher of technical communication is a strong mix of the practical and the mystical. Certainly, it is the mystical inherent in the adage that quality teaching is, as James Garfield said, ". . .a log hut, with only a simple bench, Mark Hopkins on one end and I on the other. . . ."(4) Equally certainly, however, for the teacher of technical communication, quality teaching is also practical: Mark Hopkins on one end of a telecommunications network and a student on the other.

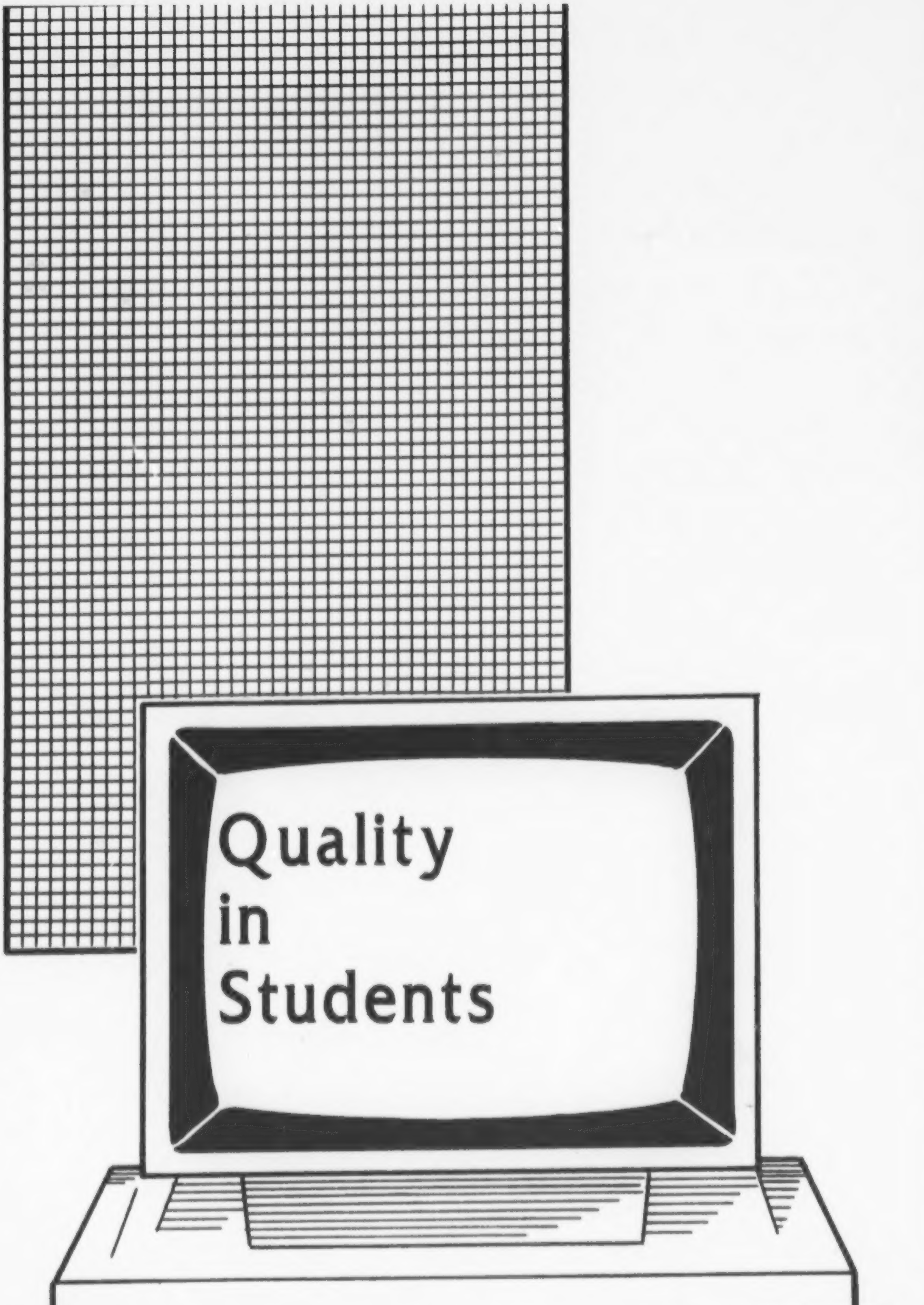
NOTES

1 Kenneth Eble, The Aims of College Teaching (San Francisco: Jossey-Bass Publishers, Inc., 1983), p. 9.

2 See Eble, Ibid., especially Chapter 2: "Teaching with Style," and William Timpson and David Tobin, Teaching as Performing (Englewood Cliffs, N.J.: Prentice-Hall, 1982).

3 I cite these as examples of the types of projects on which I have personally worked. In discussions with colleagues, the range of projects covers virtually all areas of science and technology, from basic computer documentation to reports for government agencies on complex funded research.

4 This quotation is commonly said to be "Mark Hopkins on one end of a log and a student on the other." Garfield made his remark in an address to the alumni of Williams College, New York, on December 28, 1871. Cited in Emily Morison Beck, editor, Familiar Quotations (Little, Brown and Company, Inc., 1980), p. 609.



Quality in Students

QUALITY IN A TECHNICAL COMMUNICATIONS STUDENT: "T" IS FOR TECHNICAL

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"T" is for Technical. I borrow my title from John Neuberger, a 1985 graduate from Clarkson University, who is now working as an Information Developer at IBM in Poughkeepsie, NY. John was a "quality" student who wrote an article for our STC student newsletter on how to interview for an entry-level technical writing position. Although a few major corporations such as IBM send interviewers to the Clarkson campus each fall to meet and assess our senior Technical Communications majors, many of our students make job contacts through our alumni or their own letter campaigns. John has been most successful in his job search and wanted to share his strategy with next year's senior class. I propose, as did John, that an essential aspect of a quality student within a technical communications program is the ability to function within a technical atmosphere. As John put it, "It is the environment in which I live, the people I talk to, and the things I do each day."

We can assume that the students who graduate from our programs are competent communicators; they know how to analyze their audiences, how to write directly and precisely, how to support their prose with graphics, how to organize and present material orally, and even how to select paper, type, binding, and other aspects of final publication and design. We also can assume that these students can edit the writing of others and help others improve their own prose. Most technical communication programs require many hours in communication courses as well as traditional English or Liberal Arts courses that encourage students to address a variety of audiences or give students opportunities to imagine various communication situations. Most programs also require a minimum level of competence in math, science, and computer science. While at Clarkson, that requirement usually means a year of calculus, a year of physics, biology, or chemistry, and the study of BASIC, PASCAL, or FORTRAN; most programs match these requirements in spirit if not in kind. Some programs require a concentration or minor in a technical area; a few limit that area but most let the student select according to his or her "career goals."[1] At Clarkson we recognize almost any area as meeting our "Professional Elective Concentration" requirement except the traditional Liberal Studies areas such as literature and history. We encourage our students to consider computer science as their technical area since IBM and DEC have shown a particular interest in our graduates. If "T" is for Technical, then at least in terms of transcripts or requirements, each student who graduates from Clarkson's program has achieved this essential aspect.

However, what John meant by "technical" goes beyond that competency in a special subject area. John was able to tell his potential employers that he used a computer every day to write letters and reports, to analyze and organize data, to create graphics, and even to play games. He used and felt comfortable with a technical tool. He also competed with engineering, science, management, industrial distribution, and math and computer science students in courses at Clarkson. And he cooperated with these same students in major projects in those courses. His roommates were technical students who shared with him their struggles in their thermodynamics or statics classes. Because John received his Professional Elective Concentration in engineering, he was able to say not only that he understood the vocabulary and thinking processes of engineering, but also that he was a participant in the engineering world: "I go to class with engineers; I live with engineers; I work well with them and can function well in an engineering environment."

Of course, John functioned in this environment because he had to in order to earn a degree at Clarkson. But again his success cannot be determined by credit hours or grade point average. What ensured his success were the interpersonal skills that he developed along the way. He developed these skills in the best possible way--he "stood in the shoes" of the engineer and performed tasks as an engineer might, or as Carl Rogers put it, John learned to think, listen, and feel "reflectively." He understood and accepted without judgment the values, fears, and concerns of those engineering students. Then only after he felt he could share the engineering frame of reference did John step back and assess how John as writer and as human being felt about that frame of reference. While risking his grade point average to take upper-level computer engineering courses, John shared the frustration of developing a computer program that must be constantly updated to meet a changing hardware and software market. He learned the value of collaborative writing--what error messages he could not decifer in a program, his partner usually could. He even felt the alienation computer specialists experience from the general population who label anyone who spends hours in front of a terminal a "geek." Finally, John took courses that debated the value of technology and considered the ethics of the professional. Courses in human factors and engineering ethics allowed John to assess the impact of technology and to realize how his writing about technical developments might influence peoples' lives.

To further define these interpersonal skills that John developed, I would say that he learned to listen and question. While working with a technical expert who had information John needed or while helping someone with less well developed communication skills, John learned to wait sufficient time for responses, to ask open-ended questions, to rephrase or repeat responses to insure understanding, to offer encouragement and praise, and to care about establishing long-lasting rapport with his partner. He suppressed his own ego until the information was on hand or the process complete. He also functioned as advocate for consumer. These interpersonal skills can be taught in the classroom, but for them really to "take," students such as John must be put in situations that will prove disastrous if interpersonal skills are not used. Those situations should be as close to real life as possible--within an overall technical environment that extends outside the classroom.[2]

Not every technical communications program, however, exists within a technical university; a great many major programs function well within traditional English departments and culminate in a B.A. degree rather than a B.S. degree. Internships in particular can provide any student with the chance to experience this technical environment and give students the confidence that John had when he entered the job market. Moreover, a great stress on the "technical" side of technical communications presents a problem in student recruiting. A high school senior must demonstrate excellent skills in communications as well as math and science to enter such a technical communications program. Stereotypically those students interested in communications have shied away from math and science courses while engineering students have accepted their image of poor writers. To seek students with two talents and interests, communication and technical, thus limits the number of potential students greatly. Within most university environments, programs with few majors do not share in a great many financial benefits. While program administrators may argue for quality, rather than quantity, total revenue from tuition dollars is not as impressive within a technical communications program as in engineering programs. The service load that these programs carry as they educate engineers within report writing courses cannot offset this prejudice completely. However, at the end of four years, there is no doubt that John was a very attractive job candidate. In terms that impress graduating seniors, he took more job trips than he needed to and was able to select between final offers. John then was a quality student because by the time he graduated he was a member of the technical community.

To stress the technical part of technical communications is risky. Students and programs may remain few in number. To listen so closely to what industry seems to want and to accept only those students who have potential in both technical and communication areas may alienate colleagues in traditional liberal arts areas and cause administrators to question the financial value of such a limited program to the university. However, to neglect the "technical" side of technical communications "cheats" the student who graduates of good employment possibilities. John's definition of the "technical" curriculum provides a compromise if not a solution. The environment in which the student functions should simulate the industrial technical environment as much as possible. The skills that one needs to succeed in this environment originate in liberal arts--the interpersonal skills that psychology stresses. "T" then is for technical world, not just technical requirement or course.

Notes

[1] The best resource for technical communication program descriptions is now STC's Academic Programs in Technical Communication (STC-73-85), edited by Patrick Kelley, Roger Masse, Thomas Pearsall, and Frances Sullivan.

[2] Within Carolyn Rude's Teaching Technical Editing (ATTW anthology no. 6), four of us (Brady, Barkman, Lay, and Smith) from Clarkson demonstrated how these interpersonal skills can be developed in the technical editing classroom. See "Interpersonal Skills: An Essential Component in the Editing Class" (pp. 109-128) as well as the annotated bibliography by Rude and Castle at the end of the anthology.

HELPING OUR STUDENTS ACQUIRE A SENSE OF QUALITY

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> While at work I was thinking about this same lack of care in the digital computer manuals I was editing. Writing and editing technical manuals is what I do for a living the other eleven months of the year and I knew they were full of errors, ambiguities, omissions and information so completely screwed up you had to read them six times to make any sense out of them. But what struck me for the first time was the agreement of these manuals with the spectator attitude I had seen in the shop. These were spectator manuals. . . . The mechanics in their attitude toward the machine were really taking no different attitude from the manual's toward the machine, or from the attitude I had when I brought it in there. We were all spectators. And it occurred to me there *is* no manual that deals with the *real* business of motorcycle maintenance, the most important aspect of all. Caring about what you are doing is considered either unimportant or taken for granted.[1]

In this fashion, Robert Pirsig raises the issue of quality in his best-selling book *Zen and the Art of Motorcycle Maintenance*. Among other things, the book is an incredibly determined attempt to define quality and to show how caring about what we are doing is the most crucial part of a definition of quality.

After much reflection, the narrator finally provides a definition of quality which he finds satisfactory: "the continuing stimulus which our environment puts upon us to create the world in which we live. All of it. Every last bit of it."[2] This definition, of course, is more understandable within the context of the book and the complex themes it explores. Still, the definition implies a high degree of caring about how we create. In his emphasis on caring, Pirsig offers a useful focus for defining quality in technical writing students.

How do we teach our students to care about what they are doing? We have many ways we can stress quality, but four ways seem to be the most useful to me: 1) emphasize professionalism, 2) stress quality in language, 3) examine the values of our scientific and technological society, and 4) show how technical writing has rhetoric as its basis.

Professionalism

First, and most obviously, we can teach our students to care about what they are doing through discussions of professionalism and by inviting professionals to become actively involved with our programs. Like many other technical writing teachers, I help my students to consider professionalism in a number of ways. Over the years I have collected many good articles on professionalism in technical communication. For one assignment my students do an in-depth critique on one of these articles; then we discuss their responses at length in class. The assignment defines professionalism clearly and makes students aware of the high standards they can achieve.

For our program we also have an active Board of Advisors which consists of 20 writers and editors in the Central Florida community. These advisors meet once a year to help us improve our program and are also quite involved with our program throughout the year. Many of the advisors give presentations in our "Careers in Writing" class, the first required class of our technical writing program. Our students not only hear about many facets of the technical writing field (from salaries to specific job responsibilities), but they also see professionalism in action. In all three of our workshop classes students interview a number of practicing professionals. Our advisors have been especially useful in these classes.

We also encourage our students to become actively involved with the Orlando Chapter of the Society for Technical Communication. Many of our students attend the monthly meetings and write and edit the Chapter newsletter.

Finally, our internship program is an integral part of our efforts to instill professionalism. At present, we have successfully placed over 25 students in internships with a variety of large and small companies in the Orlando area. Each student is assigned to a senior writer or editor for one semester in a heavily supervised program. The internship is beneficial to both student and employer. The student learns a variety of new skills and the employer gets to scrutinize a potential full-time employee. So far, this crucial part of our program has worked extremely well, with most of our students being offered a full-time position by the company for which they interned.

Quality in Language

Second, we can continually stress the importance of quality in language. As teachers of technical writing, we constantly mark student errors in grammar, diction, sentence structure, sentence variety, and so on. We talk about the importance of clarity for a specific audience. We discuss all the rules and options concerning effective communication. These are important points to make again and again in our classes (as well as the point that clear language is only one part of effective technical writing). Still, something seems to be missing.

In our emphasis upon clarity, we seem to omit the larger issue of decency, of value. In our discussions of jargon, euphemisms, slang, and gobbledygook, we often seem to be more concerned with the process of being precise, not humane. In short, we need to stress to our students that the value of quality language goes beyond the value of clarity. We need to stress that abuses of language ultimately demean the quality of life. Poor language dehumanizes us.

In many of my classes I try to stress these points by lecturing on books such as George Orwell's 1984. Few authors or books more effectively demonstrate what can happen when language becomes too abstract, too unrelated to reality. One of the major themes of the novel is that language can easily be manipulated, controlled, that if we no longer concern ourselves with the concrete and specific, we can find ourselves lost in a world of meaningless abstractions. In _1984_ words no longer truthfully reflect the world of people, places, and things. Abstract ideas have become far more important. In the fictive world of the novel, reality has been lost in a maze of appearances, and, as a result, people become dehumanized. Few novels end more pessimistically. As we witness Winston Smith proclaiming his sincere love for Big Brother, we realize that both he and we are lost.

Adding to this pessimism is the appendix that Orwell also wrote as part of the novel. In the appendix we see how the world of 1984 is actually a society in transition. In deliberately dry, matter-of-fact prose, Orwell relates that by the year 2050 no one in Oceania will be able to think anything negative about the Party. By the year 2050 thought-control will be complete. Yes, the novel is a grim satire, but the themes of the book can easily be related to the misuse of jargon, euphemisms, clichés and other errors of language which abound today. Orwell understood that decency in life, or quality, needs constant vigilance, and that the abuses of language could lead to far more than just problems in clarity.

The Values of Our Scientific and Technological Society

Third, we can inquire into values the way Pirsig does when he shows us that we have a limited view of rationality.

We emphasize reason over intuition, science over faith, fact over value. He suggests that we can restore quality in our lives by having a more balanced view of the roles of intuition and reason, science and faith, fact and value. As Pirsig suggests, "The dictum that Science and its offspring, technology, are 'value-free,' that is, 'quality-free,' has got to go."[3]

I use Zen and the Art of Motorcycle Maintenance in our "Survey of Technical and Scientific Literature" course, spending the last four weeks of the term on the book.[4] As Tom Pearsall says in Teaching Technical Writing, "you will find few books that explain the scientist's view of the world with more depth and understanding."[5] Few books also do a better job of challenging many of the basic assumptions of science. Pirsig's book provides an excellent summation of some major concerns of the course.

After spending the first half of the term analyzing a variety of literary, rhetorical, and other stylistic devices used by scientists in a wide range of science classics, we shift our attention to the nature of science itself. Stated simply, we challenge the basic assumptions that many people make about science--that scientists are neutral observers who give us objective knowledge about an objective reality. We see that these assumptions are nonsense. Hundreds of books and articles in the history, sociology, and philosophy of science (and many other areas, particularly in physics) have shown how subjective judgment--intuition--plays a fundamental role in scientific theory and method.

Michael Polanyi's 1958 book Personal Knowledge, a brilliant critique of modern science, shows "that in attributing truth to any methodology we make a nonrational commitment; in effect, we perform an act of faith."[6] In The Turning Point: Science, Society, and the Rising Culture (1982), Fritjof Capra, a leading physicist of our time, argues:

> Scientific theories can never provide a complete and definite description of reality. They will always be approximations to the true nature of things. To put it bluntly, scientists do not deal with truth; they deal with limited and approximate descriptions of reality.[7]

In the last part of the course, we examine the limitations of science, how human it is. We see that values cannot be separated from facts.

Before discussing Zen and the Art of Motorcycle Maintenance, we discuss the role of intuition, luck, error, envy, and other elements in James Watson's The Double Helix, a book which in the words of molecular biologist Gunther Stent, "probably . . . contributed most to the demise of the traditional view of the scientific enterprise as an autonomous exercise of pure reason by disembodied, selfless spirits, inexorably moving toward a true knowledge of nature."[8]

I have also used The Mismeasure of Man, by Harvard biologist and science historian, Stephen Jay Gould. The book is an exposé of the social and cultural biases of the best scientists of the nineteenth-century. Gould says he wrote the book to dispel "the myth that science itself is an objective enterprise, done properly only when scientists can shuck the constraints of their culture and view the world as it really is."[9]

When we finally discuss Pirsig's book, my students see that this book--part fiction, autobiography, essay, and philosophical treatise--is fundamentally a critique of our modern scientific attitude. The three major quests of the book--the narrator's quest to define quality, his quest to rediscover his alter-ego Phaedrus, and his quest to redefine his relationship with his son--are finely interwoven structurally and thematically. Not content merely to discuss quality in his major quest, Pirsig demonstrates the concept of quality in the resolution of the other two quests.

Near the end of the book when the narrator is considering suicide, his alter-ego saves him. "It has all come together."[10] Phaedrus tells us he was not insane and we understand the truth of this claim because we know finally what Pirsig means by quality. Phaedrus' arguments have expanded our views of rationality. We see the balance of intuition and reason, of science and faith, of fact and value. The denial of insanity gives the narrator/Phaedrus a new basis for his relationship with his son. In the last scene, Chris is happy to have his faith in his father's sanity reaffirmed. He "stands up on the foot pegs" of the motorcyle with an entirely new view, a new attitude.

Technical Writing and Rhetoric

Fourth, we need to show our students that technical writing has its roots in rhetoric. I am not just referring to the important field of science as rhetoric in technical communication, a topic examined so well by Michael Halloran, Carolyn Miller, and others.[11] Through Watson, Gould, and Pirsig, my students understand that science is essentially informed opinion, that science is rhetoric. Still, we need to go beyond making this obvious point in our classes. We have to emphasize that technical writing has rhetoric as its basis in other ways.

Harley Sachs offers one of the strongest opinions on this issue:

> Technical reporting continues to flounder, it seems to me, because it continues to seek its expertise in its subject matter and its ornamentation--especially in computer technology--rather than in the ancient discipline of structural rhetorical form (the strategy of technical writing) which, until modern times, was the core of education in the arts and sciences. We fail to realize that in technical reporting, only the subject is technical. Despite all the razzle-dazzle in our most technical of technological times, the substance of technical

> reporting remains a formal discipline of the mind: a rhetorical discovery of the best ways and means to persuade an audience.[12]

Merrill Whitburn adds further support to Sachs' emphasis on the traditional value of rhetoric. Whitburn describes the increasing numbers of scholars who are "identifying with the ideal orator of classical antiquity."[13] According to Whitburn, this ideal orator would never separate a liberal from a vocational education, would never separate contemplation from action. Whitburn sees this renewed interest in the ideal orator as a way to "eliminate the split between humanistic and scientific-technical-industrial culture."[14]

Through continual emphasis on professionalism, quality in language, the limitations of science, and the central role of rhetoric, we can teach our students the importance of caring about what they are doing. We must do what we can to counter the "spectator attitude" which Pirsig believes is responsible for so much incompetence.

/

NOTES

[1] Zen and the Art of Motorcycle Maintenance (New York: Bantam Books, 1984), pp.24-25.

[2] Pirsig, p.225.

[3] Pirsig, p.231.

[4] For a more detailed discussion of this course, see my article "A Rhetorical Approach for Teaching Technical and Scientific Literature," The Technical Writing Teacher, 12:2 (Fall 1985): 115-25.

[5] Tom Pearsall, Teaching Technical Writing: Methods for College English Teachers (Washington, D.C.: Society for Technical Communication, 1975), p.3.

[6] Morris Berman, The Reenchantment of the World (New York: Bantam Books, 1984), p.128.

[7] Capra, The Turning Point: Science, Society, and the Rising Culture (New York: Bantam Books, 1983), p.48.

[8] The Double Helix: A Personal Account of the Discovery of the Structure of DNA (New York: W.W. Norton and Company, 1980), p.ix.

[9] The Mismeasure of Man (New York: W.W. Norton and Company, 1981), p.21.

[10] Halloran, "Technical Writing and the Rhetoric of Science," Journal of Technical Writing and Communication, 8:2

(1978): 77-88.

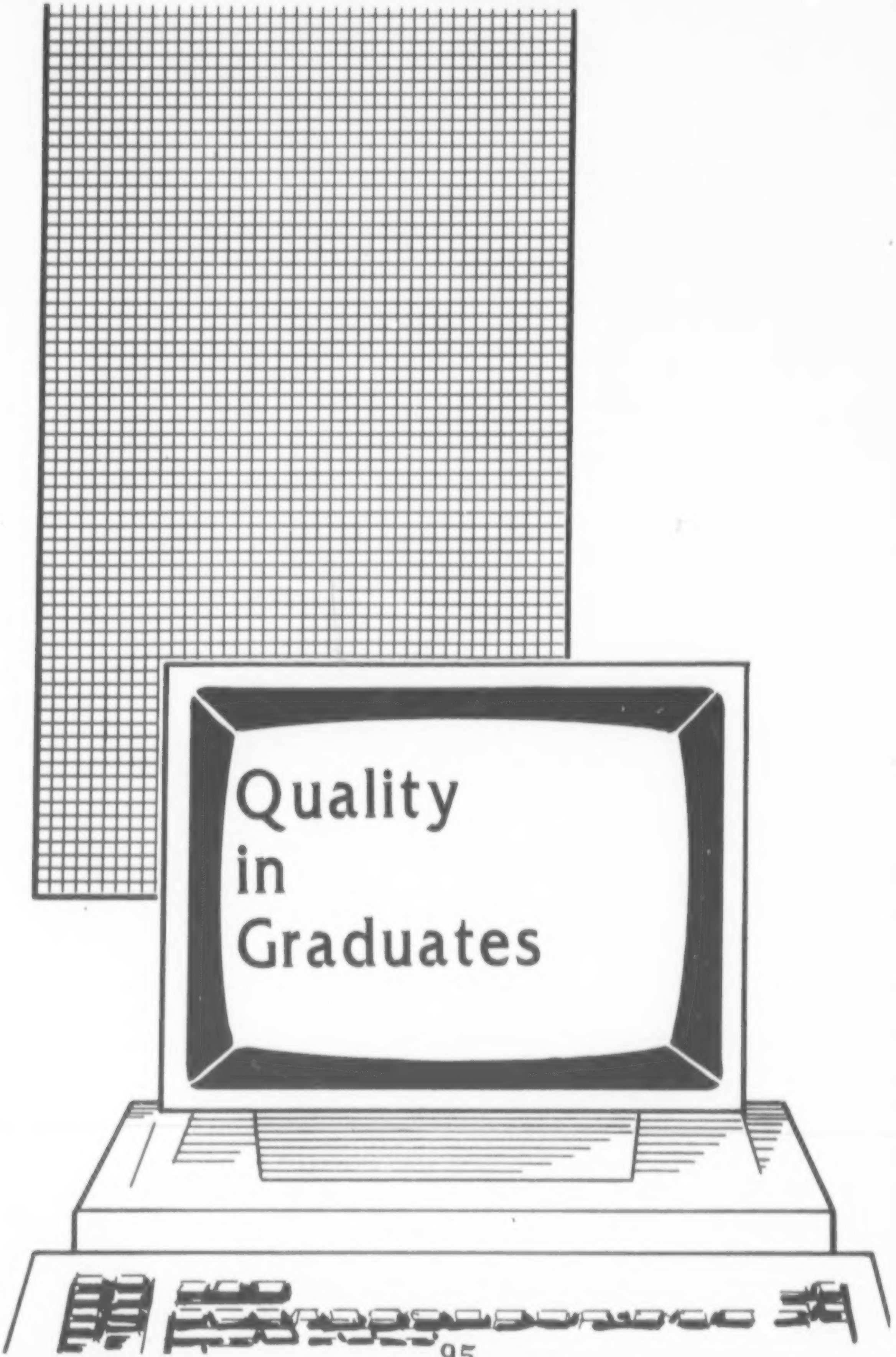
Carolyn Miller, "A Humanistic Rationale for Technical Writing," College English, 40:6 (1979): 610-17.

[11] Sachs, "Technical Reporting is Technical Rhetoric," Technical Communication, 25:4 (1978), p.11.

[12] Whitburn, "The Ideal Orator and Literary Critic as Technical Communicators: An Emerging Revolution in English Departments," Essays in Classical Rhetoric and Modern Discourse, Robert J. Connors, Lisa S. Ede, and Andrea A. Lunsford, editors (Carbondale, Illinois: Southern Illinois Univ. Press, 1984), p.246.

[13] Whitburn, p.246.

[14] Whitburn, p.246.



Quality in Graduates

WHAT IS QUALITY IN A TECHNICAL COMMUNICATIONS GRADUATE?

KARYL SEVERSON
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PACIFIC TELECOM, INC.
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Quality is an elusive substance, but it *is* substance, and it can be pinned down when we evaluate the question "What Is Quality in a Student Who Graduates from a Program?" .

When I evaluate graduates of technical communications programs for positions in my firm, I look for these competencies:

- A sound academic background in technical communications. The graduate's transcript should reveal a balance among three main areas of technical communications:

    Graphic Communications

    Written Communications

    Oral Communications

- The demonstrated ability to think analytically. I might ask a graduate to solve a hypothetical business problem for me as evidence of his or her analytical skills.

- Knowledge of the computer tools available today to aid him or her in delivering a product. Communicators who remain unacquainted with computerized communications tools are being left out in the cold.

- Versatility. She or he should possess a well-rounded background, demonstrated by pursuit and study of subjects outside the major area of interest.

- The ability to think about his or her work in business terms. A graduate should have a sense of how the work of technical communications fits into the business world where she or he wishes to work.

- Experience. Ideally a graduate would have intern experience to add to his or her list of qualifications. However, almost any business experience can work to the advantage of a technical communications graduate.

  For example, before graduation a student may have experience working in an accounting office as a data entry clerk. After graduating, the newly employed technical communicator may find herself or himself assigned as writer of a computer manual for accounting software.

- Active participation in professional groups or societies, such as the Society for Technical Communication (STC) and the Association for Computing Machinery (ACM).

A graduate should also

- Be adaptable
- Be willing to take risks
- Have a sense of humor, especially about himself or herself
- Know when and how to ask good questions, most often, the "right" questions

These qualities cannot be addressed in a technical communications program curriculum but can be addressed by the quality of program administrators and teachers.

HOW DO WE MEASURE THE QUALITY OF OUR GRADUATES?

JUDITH KAUFMAN and JOHN ELDRIDGE
TECHNICAL COMMUNICATIONS PROGRAM
EASTERN WASHINGTON UNIVERSITY

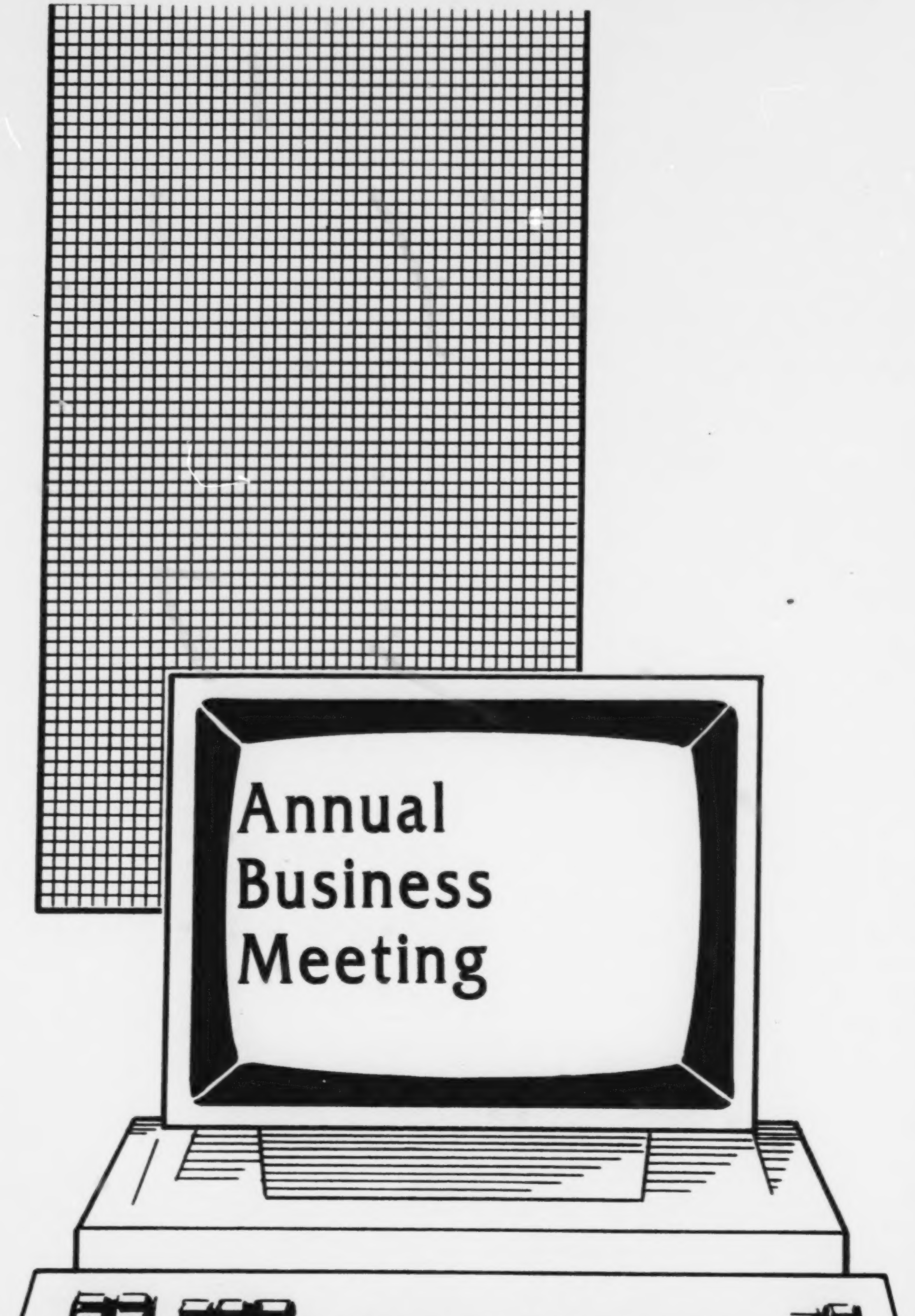
All questions about the quality of programs in technical and scientific writing come down to questions about the products of such programs. A program can be said to be of high quality if its products are graduates capable of performing as professionals. These graduates can, in turn, be judged by the quality of the documents they produce.

These documents will be of many different types, depending upon the particular writing careers chosen by the graduates. Technical and scientific writing majors may be employed to write grant proposals for non-profit organizations, manuals for users of computer or electronic equipment, articles for popular science publications, or annual reports for investors in high-tech corporations. Students who have combined a writing minor with a major in a technical or scientific field may be asked to prepare analytical reports or journal articles.

Although these and other documents written by our graduates will vary in content and purpose, they can all be judged by the same standard of quality: their ability to do the intended job for the intended audience. Baseball Hall-of-Famer Ted Williams is said to have defined a strike as "a pitch that causes the umpire to raise his right arm." A similarly practical test can be applied to most of the writing done by our graduates. Thus, the best grant proposal or recommendation report is that which achieves its goal of obtaining funding for the proposed project. It is true, of course, that a good idea may be approved despite a badly written proposal, while a well-written account of a bad idea will have little chance for success. On the other hand, there are no prizes for "Best-Written Unfunded Proposal."

If a document's quality is equated with its success in achieving its intended goal, then it follows that this quality cannot be measured prior to the document's actual use. Such is the position taken by those who oppose the calculation of readability formulas and recommend instead that technical documents be subjected to user testing. (For an excellent review of the research and arguments on this subject, see Janice C. Redish and Jack Selzer, "The Place of Readability Formulas in Technical Communication," Technical Communication, Vol. 32, No. 4 [Fourth Quarter 1985], pp. 46-52.) However, certain quantitative measures are available for judging the success of a document in use. Thus, some textbooks on writing research papers advise students that authors or works cited frequently in other sources are likely to be significant in their fields. (See, e.g., Susan M. Hubbuch, Writing Research Papers Across the Curriculum [New York: Holt, Rinehart and Winston, 1985], p. 76.) Citation indexes have been developed to document such multiple references. A more immediate measure of quality is available to the writer of a corporate profile addressed to potential investors: a successful profile should cause the corporation's stock to increase in price. The publishers of the magazine Research: Ideas for Today's Investors are well aware of this fact. They prepare and print articles about selected corporations and make reprints of these articles available free of charge to registered brokers. For their services, they receive fees from the featured corporations. They recently advertised by citing instances in which a client corporation's stock price had risen dramatically following publication of a Research profile.

As these examples suggest, if we wish to know the quality of our graduates, we should track their careers and the careers of the documents they produce. The quality of our students cannot finally be judged by their adherence to our standards in the classroom, but only by their success in meeting the needs of their actual readers. If the documents written by our former students are instrumental in achieving funding for a project, acceptance for a theory, a user-friendly reputation for a product, or an increase in a company's investment value, then--and only then--can we be assured that we have produced quality graduates.



Annual Business Meeting

PARTICIPANTS IN 1986

Virginia Book
University of Nebraska

James Corey
New Mexico Institute
of Technology

David Dyrud
Oregon Institute

Jack Falk
Servio Logic Develoment
Corporation

Janice Frost
University of Utah

Michael Gilbertson
New Mexico Institute
of Technology

John Harris
Brigham Young University

Laurie Hayes
University of Minnesota

Simon Johnson
Oregon State University

Judith Kaufman
Eastern Washington University

Mary Lay
Clarkson University

Sherry Little
San Diego State University

Sandra Oster
Portland State University

Shirley Ann Sackman
Clark College

Karyl Severson
Pacific Telecom. Inc.

Elizabeth Turpin
Federal Reserve Bank

Mary Coney
University of Washington

Beekman Cottrell
Carnegie Mellon University

William Elliott
Drexel University

David Farkas
University of Washington

Sam Geonetta
University of Missouri-Rolla

Jo Ann Hackos
Comtech Services, Inc.

Mark P. Haselkorn
University of Washington

Gloria Jaffee
University of Central Florida

Dan Jones
University of Central Florida

Patrick Kelley
Clark College

Carol Lipson
Syracuse University

Roger Masse
Pacific Telecom, Inc.

Judith Ramey
University of Washington

Marilyn Samuels
Case Western Reserve University

Jan Spyridakis
University of Washington

Andrea Walter
Rochester Institute of Technology

Toni Webb
Clark College

Muriel Zimmerman
University of California-
Santa Barbara

Don Zimmerman
Colorado State University

MINUTES
13TH ANNUAL MEETING-CPTSC
April 18, 1986
Portland, OR

The Meeting was called to order at 3:12 by President Patrick Kelley

Announcements and Reports

1.The Secretary presented the minutes of the 12th Annual Meeting. The Council approved those minutes.

2. Sam Geonetta presented the Treasurer's report. That was approved by the Council.

3. Mr. Kelley announced that 22 copies of the *STC-CPTSC Directory* had been sold to those attending the meeting. For those programs which do not appear in the Directory, a fourth edition will be published at a future date. Any information on new programs should be forwarded to Roger Massey, Patrick Kelley, or Tom Pearsall. One of the members requested that a computer data base be developed for this information.

Mr. Kelley announced that the ERIC document numbers for CPTSC *Proceedings* are attached to the 1986 agenda.

Business:

1. Marilyn Sammuels reported on the role of research liaison. She said it was too big a job for one person. She indicated that she intends to identify people who can pursue this in the future. She also reported a research project between CPTSC and ATTW which was discussed at the CCCC. The project would determine who is teaching technical writing across the country. A survey of administrators would identify a profile of technical writing teachers. Discussion followed concerning research questions, instruments, and research methodology in general. The group informally encouraged pursuit of the idea. A proposal will be presented to the Council when it is ready.

2. The 1987 meeting will be held in Rochester, NY. A discussion of dates was held. President Kelley proposed an early October date. The dates of October 8 and 9 were proposed, seconded and approved. A caution was made that in shifting to the October dates we avoid the religious holidays.

3. Gloria Jaffe invited CPTSC to the University of Central Florida on October 6,7, and 8, 1988 and Sherry Little extended her invitation for 1989 in San Diego. Joanne Hackos suggested Keystone, Colorado, hosted by the University of Colorado at Denver for 1990.

4. The slate of candidates for office was presented to the Council:

Marilyn Sauer Samuels was elected **President** by acclamation.
Sam Geonetta was elected **Vice-president** by acclamation.
Gloria Jaffe was elected **Secretary**.
Andrea Walter was elected **Treasurer**.
Carol Lipson was elected **Member-at-Large**.

A discussion followed over who was eligible to vote in the elections. The Constitution is not clear concerning attendance at the Annual Meeting versus the Business Meeting. Dan Jones moved that the executive committee clarify the voting procedures. An ammendment clarifying Article 8 of the Consitution will be distributed to the Council by August 8, 1987.

Marilyn Samuels thanked the group for their support of her.

5. Laurie Hayes thanked Patrick Kelley, his students, and Clark College for a well prepared meeting and their gracious hospitality. It was moved that a letter be sent to the President of Clark College expressing our gratitude.

The meeting was adjourned at 5:10

Respectfully submitted,
Andrea C. Walter, Secretary
April 17, 1986

TREASURER'S REPORT FOR 1985-86

This report on the treasury of the Council for Programs in Technical and Scientific Communication was current as of April 1, 1986.

Credits

Balance brought forward	$ 899.47
Memberships: 62 renewals + 21 new + 1 1986 renewal = 84 x $15.00	1,260.00
Sales of past Proceedings	58.00
Check re-issued by Eastern New Mexico State University for library purchase of Proceedings*	45.00
Interest (February, 1985-March, 1986)	111.61
	2,374.08

Debits

Postage	32.87
Phone	5.38
Check returned by bank**	15.00
	(53.25)
Balance	$2,320.83

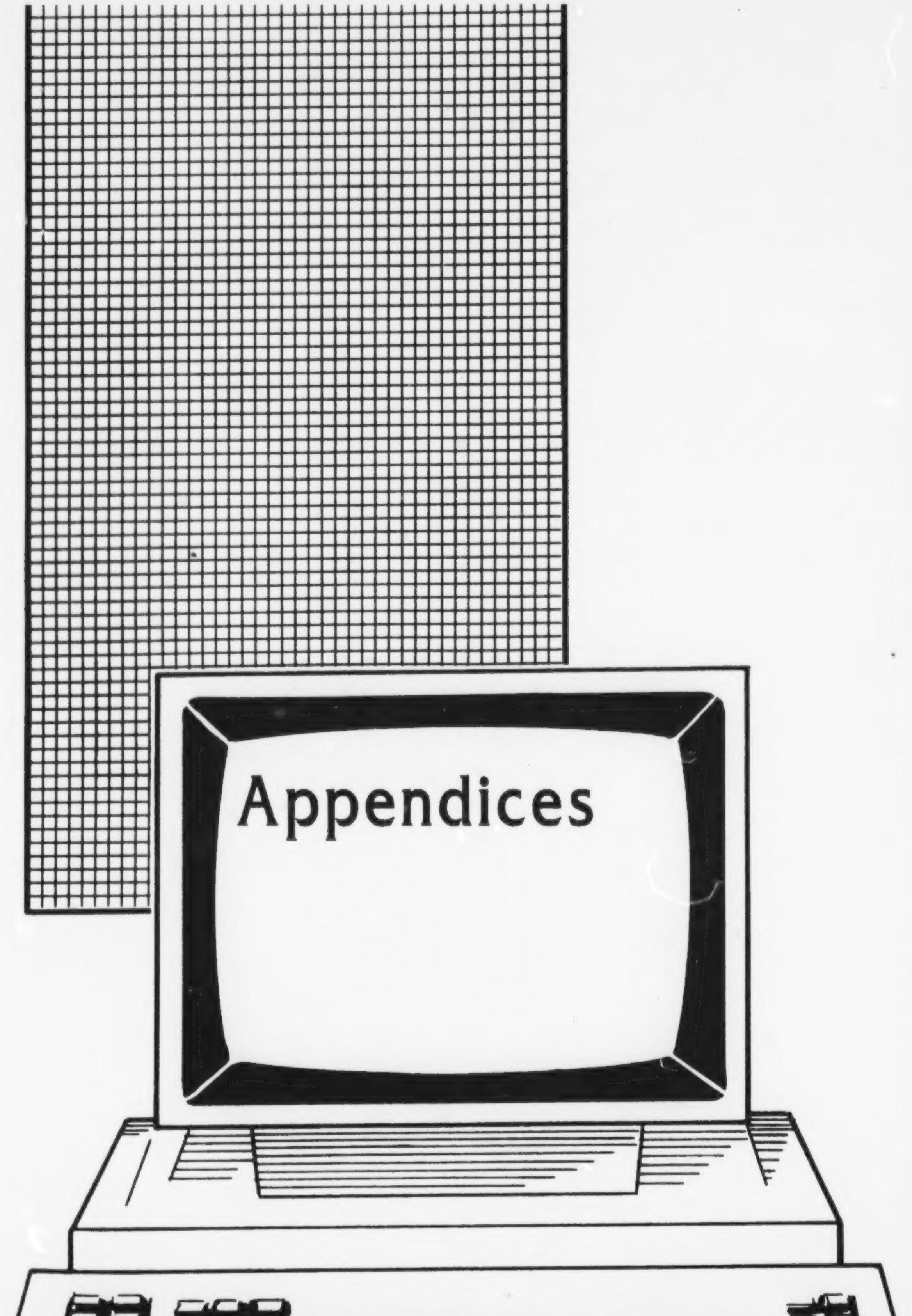
Respectfully submitted,

Sam C. Geonetta

Sam C. Geonetta
Treasurer

*I discovered an out-dated check for this in the records I received from the previous Treasurer. I returned it to ENMSU with an explanation and a request for a re-issue of the check, to which it responded positively.

**This check was drawn on a Canadian bank. The Rolla bank with the CPTSC account had a $20.00 charge for processing it. Therefore, I sent it to my successor, Andrea Walter, whose bank in Rochester, New York, would handle the currency exchange without an unreasonable charge.



Appendices

APPENDIX A: CONSTITUTION

(As Amended 1981)

ARTICLE I
NAME:

The name of the organization shall be Council for Programs in Technical and Scientific Communication.

ARTICLE II
PURPOSE:

The primary purposes of the organization shall be to (1) promote programs in technical and scientific communication, (2) promote research in technical and scientific communication, (3) develop opportunities for the exchange of ideas and information concerning programs, research, and career opportunities, (4) assist in the development of new programs in technical and scientific communication, and (5) promote exchange of information between this organization and interested parties. Said organization is organized exclusively for educational purposes.

ARTICLE III
MEMBERSHIP:

Membership shall be open to any individual or institution interested in supporting the purposes identified in Article II. Individuals or institutions whose primary responsibilities or functions are education shall be designated Regular Voting Members. Others shall be designated Special Non-Voting Members. Membership shall be open to any person without regard for race, age, sex, or religious affiliation.

ARTICLE IV
OFFICERS:

The officers of the organization shall be president, vice-president, secretary, and treasurer, each to be elected for a two-year term.

The duties of the officers shall be:

President:
1) preside at the annual national convention of the organization.
2) represent the organization at official functions.
3) serve as chairman of the executive committee.

Vice President:
1) perform all the duties of the president in the event of the president's absence.

Secretary: 1) maintain all records of the organization including matters of correspondence.

Treasurer: 1) handle all financial matters of the organization including the receiving and recording of dues and payments and paying the bills of the organization.
2) maintain an up-to-date membership list.

The president, vice president, secretary, and treasurer, plus the immediate past president and one member-at-large, elected by the membership, shall serve as an executive committee. The executive committee shall have the right to act on the behalf of the organization at such times as the organization is not meeting in full assembly except to change the constitution or carry out elections.

ARTICLE V
LIMITS:

No part of the net earning of the organization shall inure to the benefit of, or be distributable to its members, trustees, officers, or other private persons, except that the organization shall be authorized and empowered to pay reasonable compensation for services rendered and to make payments and distributions in furtherance of the purposes set forth in Article III hereof. No substantial part of the activities of the organization shall be the carrying out of propaganda, or otherwise attempting to influence legislation, and the organization shall not participate in, or intervene in (including the publishing or distribution of statements) any political campaign on behalf of any candidate for public office. Notwithstanding any other provision of these articles, the organization shall not carry on any other activities not permitted to be carried on (a) by a corporation exempt from Federal income tax under section 501 (c) (3) of the Internal Revenue Code of 1954 (or the corresponding provision of any future United States Internal Revenue Law) or (b) by a corporation, contributions to which are deductible under section 170 (e) (2) of the Internal Revenue Code of 1954 (or corresponding provision of any future United States Internal Revenue Law).

ARTICLE VI
MEETINGS:

The organization shall meet in full convention annually. The location of the annual meeting shall be determined by vote of assembly at the preceding convention. The approximate date of the meeting shall also be established.

Special meetings of the organization may be held at need as determined by the executive committee.

ARTICLE VII
FINANCES:

The dues for the organization shall be $15.00 per year for Regular Voting Members and $50.00 for Special Non-Voting Members. All dues are payable prior to or upon registration at the annual meeting.

ARTICLE VIII
ELECTIONS:

The election of officers and members-at-large to the executive committee shall be held at the annual meeting. The existing executive committee shall each year nominate a slate of officers and a member-at-large and have this slate in the hands of the membership 30 days before the annual meeting. Nominations will also be allowed from the floor at the annual meeting. Elections shall be by written ballot.

ARTICLE IX
CONSTITUTIONAL AMENDMENT:

This constitution shall be amendable by a two-thirds vote of the assembly present and voting at the annual meeting. Proposed amendments to the constitution must be in the hands of the members at least two months in advance of the annual meeting at which the vote is to be taken.

ARTICLE X
DISSOLUTION:

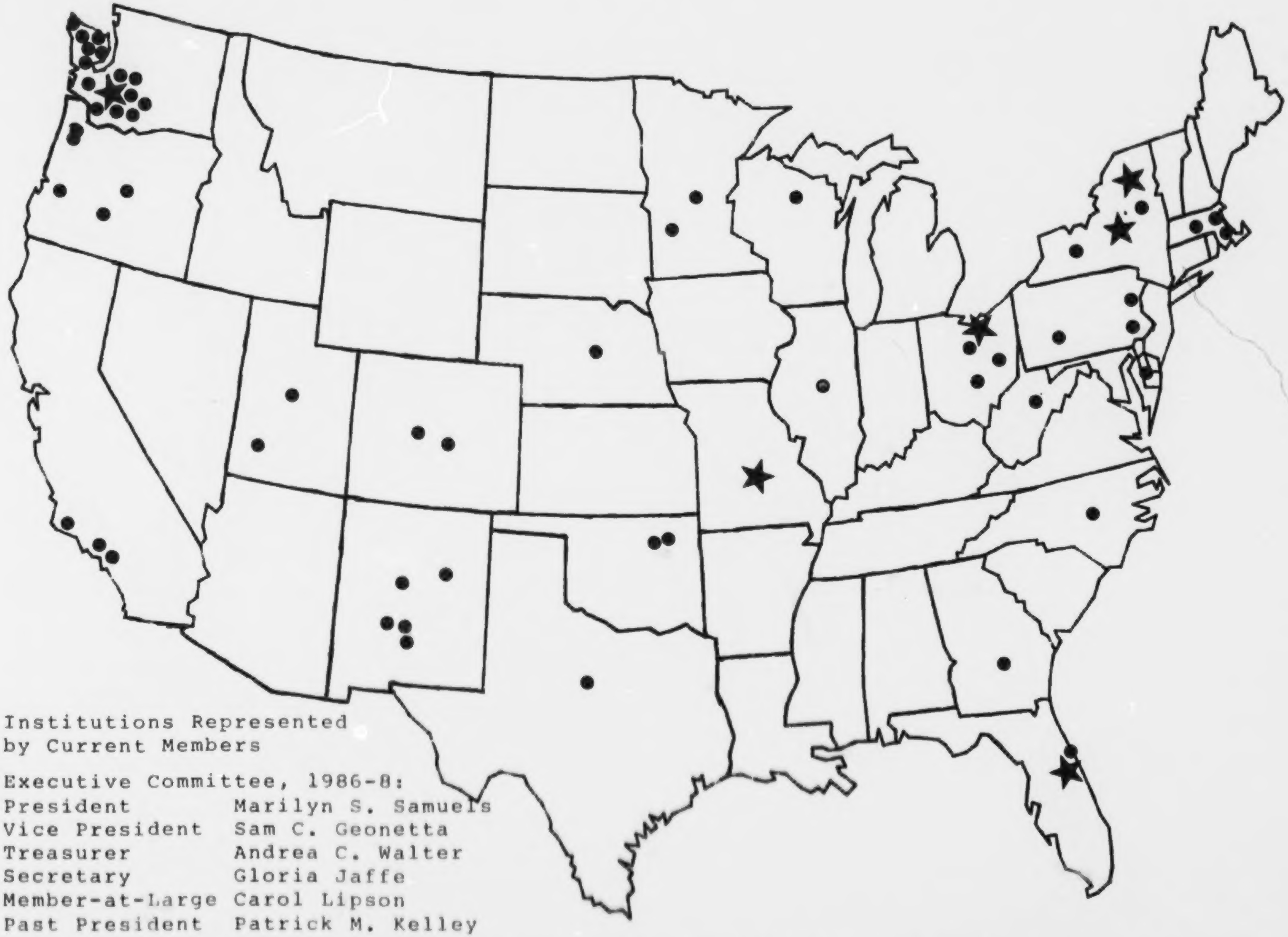
Upon the dissolution of the organization, the Board of Directors shall, after paying or making provision for the payment of all of the liabilities of the organization, dispose of all of the assets of the organization exclusively for the purposes of the organization in such manner, or to such organization or organizations organized and operated exclusively for charitable, educational, religious, or scientific purposes as shall at the time qualify as an exempt organization or organizations under section 501 (c) (3) of the Internal Revenue Code of 1954 (or the corresponding provision of any future United States Internal Revenue Law), as the Board of Directors shall determine. Any such assets not so disposed of shall be disposed of by the Court of Common Pleas of the county in which the principal office of the corporation is then located, exclusively for such purposes or to such organization or organizations, as said Court shall determine, which are organized and operated exclusively for such purposes.

ARTICLE XI
PARLIAMENTARY AUTHORITY:

All official meetings, of the organization, shall be conducted according to the *Standard Code of Parliamentary Procedure* by Alice B. Sturgis. The presiding officer shall appoint a parliamentarian to advise the assembly at each annual meeting.

APPENDIX B: ANNUAL MEETINGS, SITES, AND DATES

1st	University of Minnesota	St. Paul, MN	1974
2nd	Boston University	Boston, Ma	1975
3rd	Colorado State University	Fort Collins, CO	1976
4th	University of Minnesota	St. Paul, MN	1977
5th	Rensselaer Polytechnic Institute	Troy, NY	1978
6th	Oklahoma State University	Stillwater, OK	1979
7th	University of Central Florida	Orlando, FL	1980
8th	University of Washington	Seattle, WA	1981
9th	Carnegie-Mellon University	Pittsburgh, PA	1982
10th	University of Nebraska	Lincoln, NE	1983
11th	La Fonda	Santa Fe, NM	1984
12th	Miami University	Oxford, OH	1985
13th	Clark Community College	Portland, OR/ Vancouver, WA	1986
14th	University of Central Florida	Orlando, FL	1987



● Institutions Represented by Current Members

★ Executive Committee, 1986-8:

President	Marilyn S. Samuels
Vice President	Sam C. Geonetta
Treasurer	Andrea C. Walter
Secretary	Gloria Jaffe
Member-at-Large	Carol Lipson
Past President	Patrick M. Kelley

APPENDIX C: EXECUTIVE COMMITTEE AND INSTITUTIONS REPRESENTED BY CURRENT MEMBERS

APPENDIX D: MEMBERS IN 1986

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APPENDIX E: ERIC DOCUMENT NUMBERS FOR PAST PROCEEDINGS OF THE CPTSC

Proceedings 1974	ED 252 864
Proceedings 1975	ED 132 630
Proceedings 1976	No Proceedings
Proceedings 1977	ED 252 865
Proceedings 1978	ED 252 866
Proceedings 1979	ED 252 867
Proceedings 1980	ED 252 868
Proceedings 1981	ED 252 869
Proceedings 1982	ED 252 870
Proceedings 1983	ED 252 871
Proceedings 1984	ED 252 872

STC-73-85

society for technical communication

ACADEMIC PROGRAMS
IN
TECHNICAL COMMUNICATION

A Cooperative Effort
by the
Society for Technical Communication
and the
Council for Programs in Technical and Scientific Communication

BY
PATRICK M. KELLEY
ROGER E. MASSE
THOMAS E. PEARSALL
FRANCES J. SULLIVAN

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